Pohybové ústroji

Pokroky ve výzkumu, diagnostice a terapii

The 21th Prague-Lublin-Sydney-St. Petersburg Symposium

Orthopaedic Anthropology 2

which takes place within the

6th International Anthropological Congress of Dr. Aleš Hrdlička

3rd–5th September 2019
Humpolec | Czech Republic

Vydává
Společnost pro pojivové tkáně ČLS J. E. Purkyně z.s.
Odborná společnost ortopedicko-protetická ČLS J. E. Purkyně z.s.
Ambulantní centrum pro vady pohybového aparátu, s.r.o.

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POHYBOVÉ ÚSTROJÍ

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Vydává Společnost pro pojivové tkáně ČLS J. E. Purkyně z.s.
& Odborná společnost ortopedicko – protetická ČLS J. E. Purkyně z.s.
& Ambulantní centrum pro vady pohybového aparátu, s. r. o.
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LOCOMOTOR SYSTEM

Advances in Research, Diagnostics and Therapy

Published by The Society for Connective Tissues, Czech Medical Association of J. E. Purkyně, Prague, Society for Prosthetics and Orthotics, Czech Medical Association of J. E. Purkyně, Prague, Czech Republic and Ambulant Centre for Defects of Locomotor Apparatus Prague, Czech Republic

Call for papers

Support this journal by sending in your best and most interesting papers. The issue of the journal is published during whole year after proof acceptation of the reviewers. In occasion of the symposia (twice a year) is published the supplement.

Submitted papers: Locomotor System will review for publication manuscripts engaged in diagnostics and interdisciplinary treatment of genetic and metabolic skeletal disorders, limb anomalies, secondary osteoporosis, osteo/spondyloarthritis and another disorders that negatively influence development and quality of locomotor apparatus during human life. Both papers on progress in research of connective tissue diagnostics, medical and surgical therapy of multiple congenital abnormalities of skeleton mainly in the fields of paediatric orthopaedic surgery and plastic surgery, orthotics and prosthetics treatment, and papers dealing with biomechanics, clinical anthropology and paleopathology are appreciated.

The journal has an interdisciplinary character which gives possibilities for complex approach to the problems of locomotor system. The journal belongs to clinical, preclinical and theoretical medical branches which connect various up-to-date results and discoveries concerned with locomotor system. You can find the volumes of Locomotor System journal at http://www.pojivo.cz/cz/pohybove-ustroji/ since 1997 (free of charge). Since 2013 only electronic edition of the journal is available. That is why we recommend to all subscribers and those interested apply at http://www.pojivo.cz/en/newsletter, enter personal data, titles and e-mail address where the journal will be mailed.

Abstracts of presented papers are excerpted in EMBASE/Excerpta Medica (from the year 1994) and in the Bibliographia medica Čechoslovaca (from the year 2010). We prefer the manuscripts to be prepared according to Uniform Requirements for Manuscripts Submitted to Biomedical Journals (Vancouver Declaration, Brit med J 1988; 296, p. 401–405).

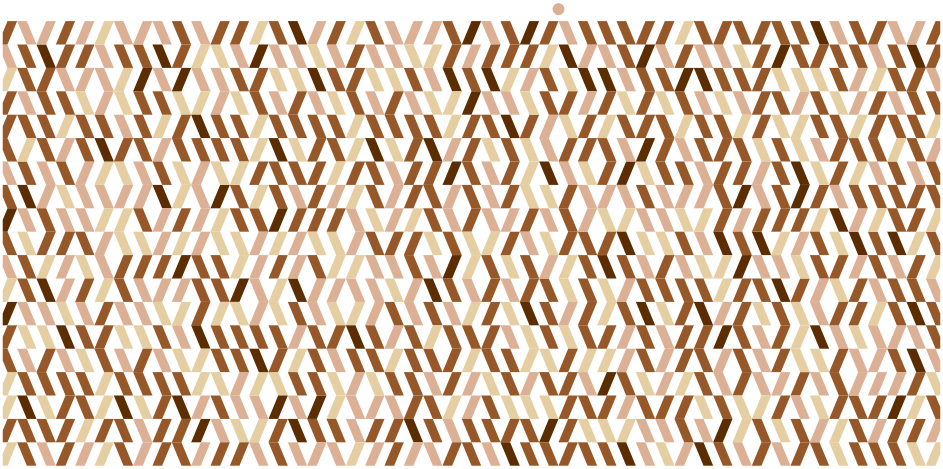
Programme

6th International Anthropological Congress of Dr. Aleš Hrdlička

150th anniversary of birth

The 21th Prague-Lublin-Sydney-St. Petersburg Symposium
Orthopaedic Anthropology 2

3rd–5th September 2019 | Humpolec | Czech Republic



All mankind is of one origin

Systém výživy kloubů dle výzkumu prof. MUDr. Milana ADAMA, DrSc.

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Organized by

The Czech Anthropological Society

Town Humpolec

A part of the congress is the 21st Prague-Lublin-Sydney-St. Petersburg Symposium

Organizing Committee

Honorary president of the Congress is

Pavel Bláha

Former long-time president of Czech Anthropological Society and member of Council of European Anthropological Association

Chair

Eva Drozdová, Masaryk University, Brno

Members

Pavel Bláha, Palestra, Prague

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Ladislava Horáčková, Masaryk University, Brno

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T. Karski – Poland

A. Kukrechtová – Czech Republic (Humpolec)

G. P. Lyritis – Greece

J. Pařízková – Czech Republic

C. Povýšil – Czech Republic

F. Rühli – Switzerland

T. Slawinska-Ochla – Poland

Š. Svačina – Czech Republic

E. V. Veselovskaya – Russian Federation

Invited Speakers

J. E. Buikstra (Arizona State University, United States of America)

M. Kaczmarek (Adam Mickiewicz University, Poland)

E. V. Veselovskaya (Russian Academy of Science, Russian Federation)

I. Mařík (West Bohemia University Pilsen, Czech Republic)

C. Povýšil (Charles University Prague, Czech Republic)

Patronage

The U.S. Embassy in the Czech Republic

Milan Štěch, Vice-President of the Senate of the Parliament of the Czech Republic

Karel Kratochvíl, Mayor of Town Humpolec

Rector of Masaryk University Brno

Rector of Palacký University Olomouc

Rector of Pardubice University

Rector of Charles University Prague

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Dean of Faculty of Physical Culture Palacký University Olomouc

Dean of Faculty of Chemical Technology Pardubice University

Dean of 1st Faculty of Medicine Charles University Prague

Czech Medical Association J. E. Purkyně

Programme of the congress

TUESDAY, SEPTEMBER 3, 2019

8.30–11.00 Registration of participants (Cinema Hall)

11.00–11.30 Opening ceremony
11.30–13.00 Plenary session
13.00–14.30 Lunch
14.30–15.45 Sessions, symposium (Fabrika Hotel)

Session 1 Mahler room

Dr. Aleš Hrdlička, Sociocultural anthropology

Session 2 Malý Hliník room

Auxology

Session 3 Orlík room

Opening of the 21st Prague-Lublin-Sydney-St. Petersburg Symposium

15.45–16.00 – Coffee break
16.00–17.30 – Sessions, symposium, poster discussion 1st part (Fabrika Hotel)

Session 4 Orlík room

21st Symposium: Biomechanics – functional adaptation of human locomotor system

Session 5 Mahler and Malý Hliník rooms

Poster discussion 1st part (posters No. 1–17)
Exhibition of posters: **Tuesday, September 3, 8.30 till Wednesday, September 4, 13.30**

18.00–19.00 – Sightseeing of Humpolec
20.00 – Organ concert in St. Nicolas Church completed of appearance of band "Ars Camerata"

WEDNESDAY, SEPTEMBER 4, 2019

9.00–10.00 Plenary session (Cinema Hall)

10.00–10.30 Coffee break

10.30–12.00 Sessions, symposium (Fabrika Hotel)

Session 6 Mahler room

Anthropogenetics

Session 7 Malý Hliník room

Palaeopathology

Session 8 Orlík room

21st Symposium: Patho-biomechanics diagnostics – orthopaedic prosthetics

11.45–12.15 Coffee break

12.15–13.30 Sessions, symposium (Fabrika Hotel)

Session 9 Mahler room

Palaeoanthropology and varia

Session 10 Malý Hliník room

Clinical anthropology

Session 11 Orlík room

21st Symposium: Biomechanics – bone diseases – diagnosis

13.30–14.00 Lunch

14.00–16.30 Tours to Želiv monastery and to Lipnice castle

16.30–18.00 Concert of Band of the Castle Guards and the Police of the Czech Republic

19.00–20.00 Awarding Hrdlička's memorial medals – with performance of saxophone band "Swinging Chipses"

20.00 – Casual Congress Dinner with musical accompaniment of local bands "Radovanka" and "Hudba Dvořák"

THURSDAY, SEPTEMBER 5, 2019

9.00–10.00 Plenary session (Cinema Hall)

10.00–10.30 Coffee break

10.30–12.00 Sessions, symposium, poster discussion 2nd part (Fabrika Hotel)

Session 12 Mahler and Malý Hliník rooms

Poster discussion 2nd part (posters No. 18–30)
Exhibition of posters: **Wednesday, September 4, 13.30 till Thursday, September 5, 15.00**

Session 13 Orlík room

21st Symposium: Osteology – bone diseases – diagnosis – comprehensive treatment
12.00–13.00 Lunch
13.00–15.00 Sessions, symposium (Fabrika Hotel)

Session 14 Mahler room

Forensic anthropology and war anthropology

Session 15 Malý Hliník room

Historical anthropology

Session 16 Orlík room

21st Symposium: Disorders of growing skeleton

15.30 Official closing of the Congress (Cinema Hall)

General information

Congress venue

The 6th International Anthropological Congress of Dr. Aleš Hrdlička takes place from September 3 to September 5, 2019 in Humpolec, the home town of Dr. Aleš Hrdlička

The congress venue is the Fabrika Hotel (Školní ulice 551 – School Street 551) and the Cinema Hall in Humpolec (Havlíčkovo náměstí 91 – Havlíček Square 91). Both buildings are situated at opposite sides of a little square

Language

The official language of the congress is English. No simultane-ous translation will be provided

The registration

A registration desk will be opened in the Cinema Hall on the first day of the congress (September 3, 2019) and then all days of the congress as follows:

September 3, 2019 (Tuesday)

8.30–13.00 at Cinema Hall
14.00–18.00 at Fabrika Hotel

September 4, 2019 (Wednesday)

8.30–14.00 at Fabrika Hotel

September 5, 2019 (Thursday)

8.30–15.00 at Fabrika Hotel

Registration fees

Participants	120 €
Participants – reduced rate	100 €
Students	80 €
Accompanying persons	80 €

The members of Honorary Committee take part in the Congress free of charge

The reduced rate is for members:
Czech Anthropological Society
Slovak Anthropological Society
Society for Connective Tissues
Czech Medical Association /CMA/ J.E. Purkynje
Society for Prosthetics and Orthotics CMA J.E. Purkynje Participants from University of Vincent Pol and Medical University in Lublin, Poland
Children's Rehabilitation Centre of Orthopaedics and Traumatology "Ogonyok", St. Petersburg, Russia

The registration fee includes: refreshments served up during coffee breaks, common dinner, organ concert, admit-tance of the Museum of Dr. Aleš Hrdlička, promenade concert on Upper Square, Memorable Medal Awards as well as awards for the winners of Dr. Hrdlička's Competition for PhD theses.

Lunches are not included in the fee

Certificate of attendance will receive every participant during registration

All further information will participants receive at registration desk or at web pages of the congress www.iacah.eu in section Last news

Persons at registration desk are ready to help partici-pants with all their problems

Presentation of papers

The allocated time for an oral presentation is 15 minutes, questions included. Keeping the time limits will be strictly observed to prevent the delays in a scientific programme.

It is advisable to save the presentation in PC before the sessions to eliminate any possible technical problems. The recommended formats are ppt, pptx and pdf.

Standard equipment of each lecture room is PC, data projector and laser pointer. Special demand for the presentation should be declared at the registration.

Posters

The poster sessions will be held in lecture rooms of Fabrika Hotel (Mahler and Malý Hliník) where are situated special walls for fixing posters. Special fixing material, obtain participants at registration desk.

Poster dimensions are: width 841 mm, length 1189 mm (format A0).

Font is min. 24 Arial. Text must be legible within the distance of 2 meters.

The author or co-author of the poster must be present by the poster during poster session.

The printing expenses of the poster are on the author.

Social programme

Free admittance to the expositions of Museum of Dr. Aleš Hrdlička in Humpolec will be available for all participants during the Congress (Museum of Dr. Aleš Hrdlička, Horní náměstí 273 – Upper Square 273, Humpolec)

September 3, 2019

18.00–19.00
Sightseeing of Humpolec – in footsteps of Aleš Hrdlička (comment will be translated into English)

The participants will meet up in front of Fabrika Hotel.

Attendant is Dr. Pavel Holub from County Archive in town Pelhřimov.

20.00–
St. Nicholas Church (Horní náměstí – Upper Square, Humpolec). An organ concert, followed by the performance of Humpolec
historic music group "Ars Camerata"

September 4, 2019

14.00–17.00
Collective tours to:
Želiv monastery or Lipnice castle
Price: 10 €

16.30–18.00
Concert of Band of the Castle Guards and the Police of the Czech Republic at "Horní náměstí" in Humpolec (Upper Square in Humpolec)

19.00–20.00
Awarding Dr. Hrdlička's Memorial Medals and announcement of final results of the Price of Dr. Hrdlička for theses in PhD category – with performance of saxophone band "Swinging Chipses" (Cinema Hall in Humpolec)

20.00 –
Casual Congress Dinner with musical accompaniment of local bands "Radovanka" and "Hudba Dvořák" (Spolkový dům – Communal House in Humpolec, Soukenická Street)Posters

Plenary sessions

September 3, 2019 11.30–13.00, Cinema Hall

11.30–12.30
Jane E. Buikstra (Arizona State University, United States of America)

"… a pyramid that stands on its point "– Ales (Alois) Hrdlicka's vision of research in physical anthropology.

12.30–13.00
Pavel Bláha (Palestra, Prague)

History of congresses of Dr. Aleš Hrdlička

September 4, 2019 9.00–10.00, Cinema Hall

9.00–9.30
Maria Kaczmarek (Adam Mickiewicz University, Poland) Female reproductive potential throughout the lifespan:

an anthropological perspective.

9.30–10.00
Elizaveta V. Veselovskaya (Russian Academy of Science, Russian Federation)

Russian school of anthropological reconstruction. Achievements and projects.

September 5, 2019 9.00–10.00, Cinema Hall

9.00–9.30
Ivo Mařík, Daniela Zemková, Alena Maříková, Šárka Petrášová, Radek Myslivec, Olga Hudáková, Miroslav Petrtýl, Ctibor Povýšil, Josef Hyánek, Miroslav Kuklík, Kazimierz Kozlowski (West Bohemia University Pilsen, Centre for Defects of Locomotor Apparatus Prague, University Hospital Motol Prague, Hospital Pribram, Czech Technical University Prague, Charles University and General Faculty Hospital Prague, Hospital Homolka Prague, Endocrionologic Institute Prague, Czech Republic, Children's Hospital at Westmead, Sydney, Australia)

Orthopaedic anthropology.

9.30–10.00
Ctibor Povýšil, Václav Smrčka (Charles University Prague, Czech Republic)

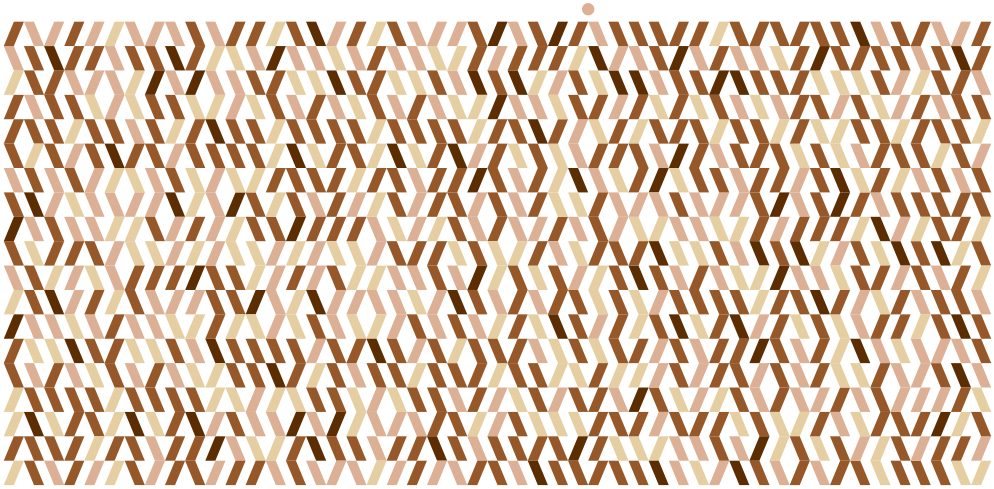
Microscopical principles for differentiation of diagenetic and pathological intra vitam changes of archaeological bone.

Acknowledgement

The congress organizers would like to thank the representatives of the town of Humpolec who generously supported the Czech Society of Anthropology in its intention to organize the congress right here in the hometown of Dr. Aleš Hrdlička. They provided the Congress with significant organizational and financial aid and organized a rich cultural program for its participants. Special thanks goes particularly to the mayor of the town of Humpolec, to Mr. Karel Kratochvíl, the Secretary of the Municipal Office, to Mr. Jiří Fiala, and to the Deputy Mayor, Mrs. Alena Kukrechtová, who have been involved in these matters and without whose participation it would not have been possible to realize them.

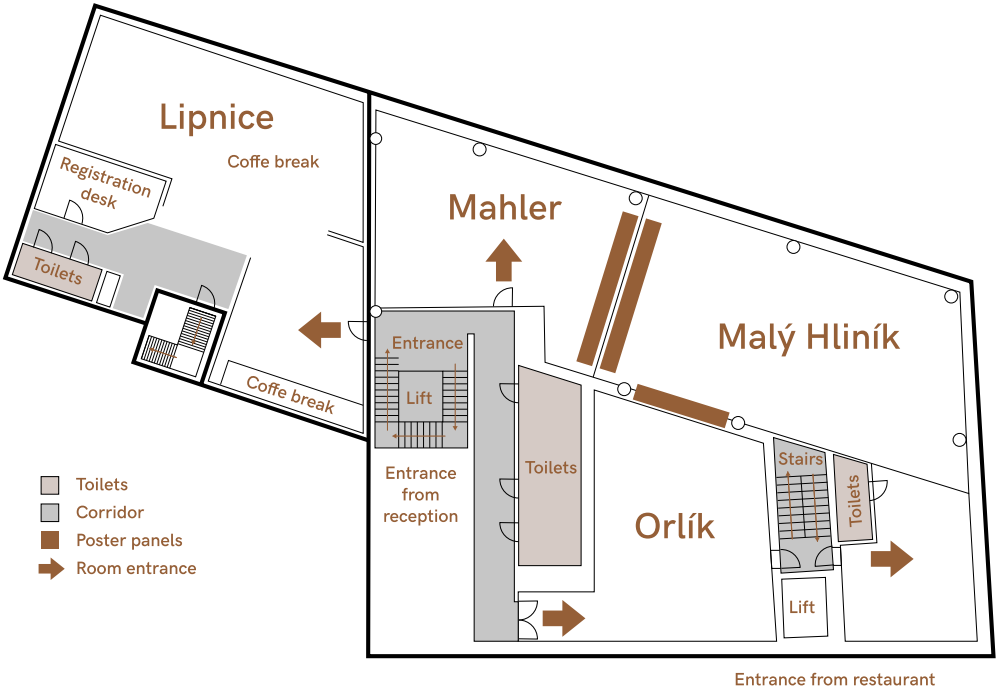
About Congress logo

The motto of the congress is Hrdlička's motto **"All mankind is of one origin"**. It is connected with the logo of the Congress, which depicts stylized, connected human figures and color variability of human skin. This logo was created by Vojtěch Cejnek. When we talked about why he decided for this design, he said that he originally wanted to match the logo to the color range of the human iris, but eventually he decided on the color of the skin, because it is evident at first sight and more accurately captures Hrdlička's motto.



Programme of the 6th International Anthropological Congress of Dr. Aleš Hrdlička

Map


Lipnice
Coffe break
Registration desk
Toilets
Coffe break
Mahler
Malý Hliník
Entrance
Lift
Entrance from reception
Toilets
Orlík
Stairs
Toilets
Lift
Toilets
Corridor
Poster panels
Room entrance
Entrance from restaurant

Cinema Hall

08.30–11.00 Registration of participants

11.00–11.30 Opening ceremony

11.30–12.30 *Jane E. Buikstra (Arizona State University, United States of America)*
"… a pyramid that stands on its point "– Ales (Alois) Hrdlicka's vision of research in physical anthropology

12.30–13.00 *Pavel Bláha (Palestra, Prague)*
History of congresses of Dr. Aleš Hrdlička

13.00–14.30 Lunch

14.30–15.45 – Session 1: Dr. Aleš Hrdlička, Sociocultural anthropology

Room: Fabrika Hotel – Mahler

14.30–14.45 – *Budil I. T.*
Aleš Hrdlička and racial anthropology

14.45–15.00 – *Maiello G.*
Giustiniano Nicolucci, an influential but forgotten pioneer of Anthropological studies

15.00–15.15 – *Anggawi S. M.*
The art of activism on Bali, Indonesia

15.15–15.30 – *Valnoha J.*
Research on social behavior during nightlife and entertainment in urban areas

15.30–15.45 – *Hermanussen M., Scheffler C.*
The importance of group identity and social position on body height

15.45–16.00 – Coffee break

14.30–15.45 – Session 2: Auxology

Room: Fabrika Hotel – Malý Hliník

14.30–14.45 – *Kutáč P., Krajcigr M.*
The application of typical error of measurement in the assess-ment of body composition measurement accuracy using the DXA method

14.45–15.00 – *Musálek M., Pařízková J., Kokštejn J., Godina E., Bondareva E.*
Normal weight obesity in preschool and middle-school-aged children

15.00–15.15 – *Novák J., Brůžek J., Sedlak P.*
Male obesity during adolescence, a feminine skeleton in adulthood? Longitudinal monitoring of obese individuals

15.15–15.30 – *Regecová V., Hamade J., Ševčíková Ľ., Janechová H., Neščáková E., Beňuš R., Masnicová S.*
Secular trends in body characteristics among Slovak students and adolescents during three decades

15.30–15.45 – *Konečná H.*
"All mankind is of one origin" in the context of modern repro-ductive technologies

15.45–16.00 – Coffee break

14.30–15.30 – Session 3: Opening of the 21st Prague-Lublin--Sydney-St. Petersburg Symposium

Main topic: ORTHOPAEDIC ANTHROPOLOGY: Interdisciplinary approach to growing skeleton

Room: Fabrika Hotel – Orlík

Welcome Speeches

Professor Ivo Mařík, MD, PhD
President of the Society for Connective Tissues Czech Medical Association (CMA) J.E. Purkynje

Professor Mikhail Dudin, MD, DSc
Honorary member of the Society for Connective Tissues, CMA J.E. Purkynje

Professor Tomasz Karski, M.D, PhD
Honorary member of the Society for Connective Tissues, CMA J.E. Purkynje)

Professor Josef Hyánek, MD, DSc
Honorary member of the Society for Connective Tissues CMA J.E. Purkynje

16.00–17.30 – Session 5: Poster discussion 1st part (posters No. 1–7)

Rooms: Fabrika Hotel – Mahler

Posters will be exhibited from Tuesday, September 3, 8.30 till Wednesday, September 4, 13.30

Tuesday, September 3, 2019

1. *Aidonis A., Papageorgopoulou Ch.*
Skull surgery in ancient Greece: New cases of trepanation from Classical-Hellenistic times

2. *Gkaniatsou E., Vika E., Papageorgopoulou Ch.*
Breastfeeding and weaning patterns in ancient Thessaloniki

3. *Kostrhun P.*
Aleš Hrdlička and american archaeologists and anthropologists in Moravia between the two world wars

4. *Novotná K., Fialová D., Chocholová E., Drozdová E., Brzobohatá K., Klíma B.*
Ancient DNA mining from chemically treated and non-treated human dental calculus

5. *Půtová L., Smrčka V., Trubač J.*
Diet reconstruction in High Middle Ages to Early Modern Period population

6. *Rasskazova A., Khokhlov A., Safarova I.*
Craniofacial identification of high church hierarch buried in the Transfiguration Cathedral in Tver

7. *Teschler-Nicola M., Mandl K., Becker S., Stelzer S., Pahr D., Weiss-Krejci E.*
A "perforated" human hyoid bone: bone artefact or thyroglos-sal duct cyst?

18.00–19.00 – Sightseeing of Humpolec

20.00 – Organ concert in St. Nicolas Church completed of appearance of band "Ars Camerata"

16.00–17.30 – Session 5: Poster discussion 1st part (posters No. 8–17)

Rooms: Fabrika Hotel – Malý Hliník

Posters will be exhbited from Tuesday, September 3, 8.30 till Wednesday, September 4, 13.30

Tuesday, September 3, 2019

8. *Seifert Z., Shbat A., Klepáček I.*
Virtual projection of 2D basic facial features onto a 3D model

9. *Vymazalová K., Vargová L., Horáčková L., Račanská M., Jarošová I., Trampota F., Kala J.*
Occurrence of scurvy in the Czech Lands at various historical periods

10. *Vytlačil Z., Drtikolová Kaupová S., Poláček L., Velemínský P.*
Residential mobility in Great Moravia investigated using strontium isotope analysis

11. *Annar D., Feher P., Zsakai A., Muzsnai A., Bodzsar E.*
Turner-syndrome patients' body structural characteristics

12. *Asienkiewicz R., Nowacka-Chiari E., Biczysko G., Skorupka E.*
Changes in physical development and motor fitness of students studying at the University of Zielona Góra (1990–2015)

13. *Asienkiewicz R., Tatarczuk J., Wandycz A.*
The secular trend in the height and weight of boys and girls residing in Lubusz Region (2002–2017)

14. *Chaplinskaya E. V., Sakhno I. P., Mezen N. I., Korbut Y. I., Hryharovich V. V.*
Comparative characteristics of biological indicators of students from different countries of the world

15. *Feher P., Annar D., Zsakai A., Bodzsar E.*
Quantitative ultrasound densitometrical and body structural parameters in screening of bone structural abnormalities in women

16. *Hrušková M., Landauerová M., Čermáková S.*
The influence of training on the physical characteristics of adolescent swimmers and hockey players

17. *Hrušková M., Mráčková P., Bublíková, V.*
Tests of motoric performance and physical fitness in Czech professional and voluntary firefighters

14.30–15.30 – Session 3: Opening of the 21st Prague-Lublin--Sydney-St. Petersburg Symposium

Anniversary of Professor Tomasz Karski, MD, PhD

Introduction: *Olga Hudáková, MD, PhD*

Moderator: *Professor Josef Hyánek, MD, DSc (Honorary president of the Society for Connective Tissues, Czech Medical Association J.E. Purkynje)*

14.30–14.50 *Karski T., Karski J., Domagala M.*
Syndrome of standing 'at ease' on the right leg as an important factor in the development of the so-called adolescent idiopath-ic scoliosis (AIS) and an influencing factor in the pathology of right shank, knee, hip and back pain

Anniversary of Prof. Mikhail Dudin, MD, DSc

Introduction: *Olga Hudáková, MD, PhD*

Moderator: *Professor Ivo Mařík, MD, PhD (President of the Society for Connective Tissues, Czech Medical Association J.E. Purkynje)*

14.50–15.10 *Dudin M., Pinchuk D., Pankratova G.*
Interdisciplinary collaboration in the study of the children's musculoskeletal system: facts, reflections, conclusions

16.00–17.20 – Session 4: Biomechanics – functional adaptation of human locomotor system

Room: Fabrika Hotel – Orlík

16.00–16.20 *Pařízková J., Sedlak P., Musálek M.*
The impact of adaptation to hypokinesia during early growth

16.20–16.40 *Kott O., Vrbská V.*
Sedentary work – The importance of adopting and maintaining correct sitting posture. Knowledge translation

16.40–17.00 *Karski T., Karski J., Domagala M., Słowińska B., Boryga B., Pyrc J.*
Improper sitting position in Children, Adolescents and Adults. Causes. Clinic. Physiotherapy

17.00–17.20 *Van Loon P. J. M., Soeterbroek A. M., Grotenhuis A.*
Homo Erectus and backpain? Being Homo Sedens from birth is an unhealthy evolution!

15.10–15.30 – Family photo of participants

15.30–16.00 – Coffee break

Cinema Hall

9.00–9.30 – *Maria Kaczmarek (Adam Mickiewicz University, Poland)*
Female reproductive potential throughout the lifespan: an anthropological perspective

9.30–10.00 – *Elizaveta V. Veselovskaya (Russian Academy of Science, Russian Federation)*
Russian school of anthropological reconstruction. Achievements and projects

10.00–10.30 – Coffee break

10.30–11.45 – Session 6: Anthropogenetics

Room: Fabrika Hotel – Mahler

10.30–10.45 *Chocholová E., Drozdová E., Fialová D., Brzobohatá K., Chochola V.*
Need for novel detection targets in tuberculosis diagnostics of historical specimens – bioinformatic analysis

10.45–11.00 *Chocholová E., Fialová D., Drozdová E., Skoupý R., Brzobohatá K., Zwinsová B., Vídeňská P., Chochola V.*
Microbial contamination of ancient human dental calculus studied by scanning electron microscopy and metagenomic approach

11.00–11.15 *Fialová D., Chocholová E., Drozdová E., Brzobohatá K., Zwinsová B., Vídeňská P., Chochola V., Klíma B.*
Study of domestication via human dental calculus in the Early Middle Ages

11.15–11.30 *Šenovská A., Drozdová E., Vaculík O., Brzobohatá B., Fialová D., Šmerda J.*
Mitochondrial haplogroups of ancient samples from Czech Republic: Comparison of two nearly located burial Sites

11.30–11.45 *Brzobohatá K., Bus M., Lembring M., Hocker F., Allen M.*
Genetic analysis of individuals from Vasa ship

11.45–12.15 – Coffee break

10.30–11.45 – Session 7: Palaeopathology

Room: Fabrika Hotel – Malý Hliník

10.30–10.45 *Smrčka V.*
Biomolecular paleopathology from my point of view

10.45–11.00 *Smrčka V.*
Czech paleopathology, past and future

11.00–11.15 *Jakobej L.*
Reconstruction of war injuries on selected skull preparations from the ossuary in Žehuň

11.15–11.30 *Tvrdý Z., Jarošová I.*
Anthropology, health and diet of Eneolithic and Bronze Age populations from Modřice (Czech Republic)

11.30–11.45 *Vlach M.*
Antonine Plague: The case study of epidemiological modelling and impact evaluation

11.45–12.15 – Coffee break

10.30–12.00 – Session 8: Patho – biomechanics – diagnostics – orthopaedic prostethics

Room: Fabrika Hotel – Orlík

10.30–10.50 *Arsenev A., Dudin M.*
Cuneiform vertebral deformation in patients with AIS

10.50–11.10 *Krawczyk P.*
Possibilities of orthotic treatment in children with cerebral palsy

11.10–11.25 *Pankratova G., Dudin M.*
Evaluation of the brace treatment effectiveness in patients with progressive scoliosis

11.25–11.40 *Černý P., Drnková J., Kott O., Negrini S.*
Design of spinal brace shape classification

11.40–12.00 *Arsenev A., Vasilevich S., Dudin M., Falinskii A.*
Prospects of application of 3D scanner in terms of children's orthopedic center

12.00–12.15 – Coffee break

12.15–13.30 – Session 9: Palaeoanthropology and varia

Room: Fabrika Hotel – Mahler

12.15–12.30 *Nowaczewska W., Binkowski M.*
The taxonomic assessment of new hominin molar and premolar from Stajnia Cave (Poland)

12.30–12.45 *Petr M., Pääbo S., Kelso J., Vernot B.*
Limits of long-term selection against Neanderthal introgression

12.45–13.00 *Petr M., Hajdinjak M., Fu Q., Essel E., Golovanova L. V., Doronichev V. B., Shunkov M. V., Derevianko A. P., Rougier H., Crevecoeur I., Semal P., Lalueza-Fox C., Rasilla M., Rosas A., Meyer M., Vernot B., Pääbo S., Kelso J.*
The evolutionary history of Denisovan and Neanderthal Y chromosomes

13.00–13.15 *Vasilyev S., Borutskaya S. B., Galeev R. M., Yatsishina E. B., Kovalchuk M. V., Ushakov V. L.*
Application of computed tomography in anthropological study of ancient Egyptian mummies

13.15–13.30 *Jančová M., Štelcl J., Klíma B. F., Drozdová E.*
Analysis of chemical elements on surface enamel and localised enamel hypoplasia of human primary canines (LHPC) via EDX method in the Necropolis of Great Moravia in Znojmo-Hradiště (9th–10th Century, Czech Republic)

12.15–13.15 – Session 10: Clinical anthropology

Room: Fabrika Hotel – Malý Hliník

12.15–12.30 *Gimunová M., Vodička T., Sebera M., Kalichová M., Skotáková A., Hedbávný P., Jánsky K., Kolářová K.*
Do the sport dance, classical ballet and Slovakian folklore dance training affect the gait stereotype?

12.30–12.45 *Hrušková M., Ťoupalová L., Vašková I., Rejtharová D.*
The physical characteristics of preschoolchildren and school-children in relation to the type of nutrition in infancy

12.45–13.00 *Koziel S., Gomula A., Nowak-Szczepanska N.*
Maternal stress during pregnancy and its effect on postnatal growth in school children

13.00–13.15 *Klášterecká R., Chrastina J., Vaňharová M.*
Health benefits of Yoga: a scooping review

13.15–13.30 *Davide Barbieri*
The Lombard Paradox: a historical perspective

14.00–16.30 – Tours to Želiv monastery and Lipnice castle
16.30–18.00 – Concert of Band of the Castle Guards and the Police of the Czech Republic
19.00–20.00 – Awarding Hrdlička's medals – with performance of saxophone band "Swinging Chipses"
20.00 – Casual Congress Dinner with musical accompaniment of local bands "Radovanka" and "Hudba Dvořák"

12.15–13.35 – Session 11: Biomechanics - bone diseases - diagnosis

Room: Fabrika Hotel – Orlík

12.15–12.35 – *Vasilevich S., Arsenev A., Kurchenko S., Dudin M., Falinskii A.*
Piezoelectric effect in bone during extracorporeal shock wave therapy in experiment

12.35–12.55 – *Pankratova G., Dudin M.*
Functional violations of urinary system in children with idiopathic scoliosis

12.55–13.15 – *Khaymina T., Avaliani T., Karpenko M., Dudin M., Pinchuk D.*
Features of endogenous neuropeptides in children with initial symptoms of AIS

E – poster

13.15–13.25 – *Rybka D., Dudin M., Sharova L.*
Ultrasound diagnosis of paravertebral muscles in children with AIS before and after treatment

E – poster

13.23–13.35 – *Bober S. S., Dudin M., Uzdennikova M.*
Characteristics of the spatial orientation of the vertebral column, shoulder and pelvic girdle in patients 7–17 years of age with initial symptoms of scoliosis

Cinema Hall

9.00–9.30 *Ivo Mařík, Daniela Zemková, Alena Maříková, Šárka Petrášová, Radek Myslivec, Olga Hudáková, Miroslav Petrtýl, Ctibor Povýšil, Josef Hyánek, Miroslav Kuklík, Kazimierz Kozlowski (West Bohemia University Pilsen, Centre for Defects of Locomotor Apparatus Prague, University Hospital Motol Prague, Hospital Pribram, Czech Technical University Prague, Charles University and General Faculty Hospital Prague, Hospital Homolka Prague, Endocrionologic Institute Prague, Czech Republic, Children's Hospital at Westmead, Sydney, Australia)*
Orthopaedic anthropology

9.30–10.00 *Ctibor Povýšil, Václav Smrčka (Charles University Prague, Czech Republic)*
Microscopical principles for differentiation of diagenetic and pathological intra vitam changes of archaeological bone

10.00–10.30 Coffee break

10.30–12.00 Session 12: Poster discussion 2nd part (posters No. 18–23)

Rooms: Fabrika Hotel – Mahler

Posters will be exhibited from Wednesday, September 4, 13.30 till Thursday, September 5, 15.00

Thursday, September 5, 2019

18. *Hurbo T., Salivon I.*
Age variation of cephalic index according to schoolchildren transverse and longitudinal studies data

19. *Kopecký M., Malinčíková J., Václavíková J., Kuchaříková M., Hrubá R., Pokorná J.*
Monitoring of body composition in boys aged 12–15 and girls with obesity during a weight reduction stay in Lázně Teplice nad Bečvou, a.s.

20. *Kopecký M., Stříbrná L., Hrubá R.*
Sleep quality and sleep patterns in men and women in relation to body composition

21. *Marčeková M., Neščáková E., Mellová Y.*
The influence of nourishment on the somatic growth of children from birth to one year of life (The longitudinal study)

22. *Polcerová L., Kondeková M., Králík M., Beňuš R.*
Examination of population differences in radio-ulnar gradients on pilot samples of the Slovak and Czech population

23. *Polina N.*
The study of color preferences of belarusian students

12.00–13.00 – Lunch

10.30–12.00 – Session 12: Poster discussion 2nd part (posters No. 24–30)

Rooms: Fabrika Hotel – Malý Hliník

Posters will be exhibited from Wednesday, September 4, 13.30 till Thursday, September 5, 15.00

Thursday, September 5, 2019

24. *Přidalová M., Marešová K., Zbořilová V., Kalčíková P.*
Somatic profil in young aged children

25. *Přidalová M., Prášil D., Marek P.*
Relation between BMI and morphological parameters of foot in young school-age children

26. *Samešová D., Sedlak P., Novák J., Ondřejíková L., Pařízková J.*
Secular changes in body composition and fat distribution in Czech preschool children

27. *Skryhan H.*
Influence of a complex of socio-economic factors on physical development of teenagers of Belarus

28. *Škultétyová A., Koziel S. M., Králík M.*
Inter-population variation in the metacarpophalangeal pattern profiles

29. *Zbořilová V., Přidalová M., Kaplanová T.*
Reference curves of selected circumferential parameters for Czech children aged 6 to 11 years

30. *Kalčíková P.*
Characteristics of elite youth soccer players by date of birth and biological maturity

31. *Marfina V.*
Dynamic observation of physical development indices of schoolchildren in the Republic of Belarus

12.00–13.00 – Lunch

10.30–12.00 – Session 13: Osteology - bone diseases - diagnosis - comprehensive treatment

Room: Fabrika Hotel – Orlík

10.30–10.50 *Povýšil C.*
Pathomorphology of crystal-associated osteoarthropathies in bioptic and archaelogical materials

10.50–11.15 *Zemková D., Mařík I., Maříková A., Petrášová Š, Hudáková O.*
Hypophosphatemic rickets: growth and body proportions in a group of Czech patients conventionally treated

11.15–11.40 *Mařík I., Zemková D., Maříková A., Myslivec R., Hudáková O., Kuklík M., Povýšil C.*
The orthopaedic problems connected with vitamin D me-tabolism: Rickets, Osteomalacia, Hypophosphatemic rickets (X-linked hypophosphataemia)

11.40–12.00 *Vodička O.*
Burosumab in the treatment of pediatric patients with XLH: results of recent clinical trials

12.00–13.00 – Lunch

13.00–14.00 – Session 14: Forensic anthropology and anthropology in response to natural disasters and wars

Room: Fabrika Hotel – Mahler

13.00–13.15 *Jankauskas R.*
Anthropology as the meeting ground of several disciplines: identification of remains of leaders of 1863–1864 uprisal

13.15–13.30 *Fialová D., Skoupý R., Drozdová E., Kováčik P. Application of SEM-EDX in forensic and historic anthropology through dental fillings*

13.30–13.45 – *Svobodová H.*
The difficulty of a forensic geneticist's work

13.45–14.00 *Krošláková M.*
Wandering through Central Europe in the Middle Ages: possible burial of an Outlander

Cinema Hall

15.30 – Official closing of the Congress

13.00–14.45 – Session 15: Historical anthropology

Room: Fabrika Hotel – Malý Hliník

13.00–13.15 *Beran-Cimbůrková P.*
Anthropological analysis of skeletal remains found in a circular object (middle bronze age) from Nymburk (Czech Republic)

13.15–13.30 *Fojtová M.*
Extraordinary Great-Moravian graves from Staré Město in the view of an anthropologist. A preliminary report

13.30–13.45 *Hukelová Z.*
Life at Early Bronze Age site of Nižná Myšľa

13.45–14.00 *Koukli M., Siegmund F., Papageorgopoulou Ch.*
Stature estimation on northern Greek populations of Roman time

14.00–14.15 *Pavelková J., Furmánek V.*
Demographic analysis of civilization of south-eastern urnfields in Slovakia

14.15–14.30 *Nováček J.*
Burials from the Merovingian aristocracy from Gotha – Boilstädt

14.30–14.45 *Scheelen-Nováček K., Nováček J., Bátora J., Kierdorf H., Schultz M.*
Evidence of interpersonal violence in the Early Bronze Age cemetery of Ludanice – Mýtna Nová Ves

13.00–15.00 – Session 16: Disorders of growing skeleton

Room: Fabrika Hotel – Orlík

13.00–13.20 *Smrčka V., Dick D., Shahed S., Musilová Z., Köhler K., Tvrdý Z.*
Congenital Anomalies in Neolithic Lengyel Culture

13.20–13.40 *Zemková D., Balaščáková M., Paprskářová M., Moslerová V., Mařík I.*
Pycnodysostosis in a Czech toddler, sclerosing bone dysplasia

13.40–14.00 *Doktorová H., Hraběta J., Groh T., Abdel Rahman M., Feriančíková B., Černá T., Podhorská N., Eckschlager T.*
Neuroblastoma in musculoskeletal system, tumor hypoxia, HIF-1 and chemoresistance

14.00–14.20 *Ryba L., Rybová S., Nechutný J., Mařík I.*
Perthes' disease and femoroacetabular impingement in a growing patient

14.20–14.40 *Karski J., Okoński M., Ostrowski J., Matuszewski Ł., Kandzierski G., Karski T.*
50th Anniversary of Dega pelvic osteotomy in treatment of DDH – dysplasia, subluxation or luxation of the hip joint

14.40–15.00 *Van Loon P. J. M., Soeterbroe A. M., Grotenhuis A. H.*
Anthropology and the physical presentation of Homo sapiens in the 21th century. Modern man and his posture

Ivo Mařík, Petr Krawczyk, Tomasz Karski, Mikhail Dudin
Closing of the Symposium and planning The 22nd Prague-Lublin-Sydney-St. Petersburg Symposium

Opening of the 6th International Anthropological Congress of Dr. Aleš Hrdlička

Opening congress speech of

Associated Professor Dr. Eva Drozdová, PhD

Chair of the Congress
Masaryk University, Brno, Czech Republic

Ladies and Gentlemen,

Welcome to Humpolec, the 6th International Anthropological Congress of Dr. Ales Hrdlicka.

This is a Jubilee Congress to commemorate the 150th anniversary of Hrdlicka's birth in a nearby village where he lived till he was 14 years old. Even though his exceptional abilities could most probably be put down to the genes, family support and given opportunities, we can assume that his abilities and his thinking were also influenced by 'genius loci' of his birthplace and the people he met in his childhood who formed his thinking. I am very happy that this Jubilee Congress is being held in his birthplace so the researchers and scientists from all over the world, interested in his life and work, can get to know the place better. The motto of the Congress is Hrdlicka's slogan 'All mankind is of one origin'. The logo of the Congress, depicting stylized interconnected human figures with different skin colours, expresses the same idea. The logo is the work of the graphic designer Vojtech Cejnek. When we asked him why he had decided to go for this design, he said that originally he had been thinking of using the colour spectrum of the human iris but in the end he had chosen the skin colours, which are apparent at first sight and more precisely convey Hrdlicka's motto. For us, the scientists studying a human being and his variability, the skin colour is a natural and important biological sign. Anthropology as a branch of science freed itself from the prejudices in the middle of the 20th century whereas in human society these prejudices concerning the visual differences between people are still alive. Therefore it is our task to recur to Hrdlicka' s motto and remind the people that we are all of the same origin. What pleases me is the fact that the same idea was depicted in a logo by an artist who has nothing to do with anthropology and still feels the need to emphasize the common origin of all people.

The Organization team are very grateful to Humpolec town authorities for holding the Congress in Hrdlicka' s birthplace. The Czech Anthropological Society was generously supported by the town authorities in their intention to hold the Jubilee Congress exactly in the celebrant's birthplace. They have provided great organisational and financial help and prepared a rich cultural program which you can definitely look forward to.

Thanks to the town representatives we were able to award laureates in scientific and civil categories with Hrdlicka's memorable medals. I welcome amongst us all the prize winners and I truly appreciate their effort to come to receive the medals personally and to give lectures at the plenary meetings.

We announced the contest in the category of doctorate theses with anthropological topics for the works from the Czech republic. I heartily congratulate all the winners.

I thank Karel Kratochvil, the Mayor of Humpolec, Jiri Fiala, the Secretary of the Town Committee and Alena Kukrechtova, the Deputy Mayor for their engagement. Without you, none of this would have happened.

I am very happy about the number of participants this year. The Congress Programme is full of lectures and poster presentations from all fields of anthropology as well as interdisciplinary branches. A part of the Congress is 21st Symposium Prague-Lublin-Sydney-St. Petersburg focused on interdisciplinary approach to growing skeleton. I really appreciate the very good cooperation with Ivo Marik and his colleagues from The Society for Connective Tissues- in the organization of the Congress.

I also welcome the guests who provided patronage and support – Mrs. Jennifer Bachus, the chargé d'affaires of The American Embassy in Prague, – Tomas Kasparovsky, the Dean of Faculty of Science, Masaryk University Brno and Petr Kalenda, The dean of Faculty of Chemistry and Technology of Pardubice University.

I thank the rectors of the biggest Czech universities – The Charles University in Prague, Masaryk University in Brno, Palacky University in Olomouc and University in Pardubice, the deans of 1st Medical Faculty Charles University in Prague, the Faculty of Physical Culture and the Faculty of Health Sciences of Palacky University in Olomouc, and Medical Society of Jan Evangelista Purkyne who took patronage over our scientific part. I also thank Milan Stech, the Deputy Chairman of the Senate of Parliament of the Czech Republic for his patronage over the Congress. Even though the above mentioned gentlemen cannot be here with us, we highly appreciate their interest and support to the Congress.

I truly hope that you will get a lot of interesting observations from the scientific part as well as interesting experiences from the cultural programme and from the stay in our country.

A more material memory from the Congress might be a silver memorable coin dedicated to Hrdlicka's birth anniversary and issued by the Czech National Bank. This act was prompted by the Town of Humpolec and partially by The Czech Anthropological Society.

I wish you all a lot of scientific inspiration, welcoming and friendly atmosphere at presentations of our scientific achievements. I wish all participants a very nice stay in the Czech-Moravian Highlands.

Opening speech of

Associated Professor Dr. Pavel Bláha, PhD

Honorary president of the Congress
Former long-time president of Czech Anthropological Society
and member of Council of European Anthropological Association
Palestra, Prague, Czech Republic

Ladies and gentlemen, dear colleagues, representatives and guests of Humpolec,

It is my great honor to open the 6th International Anthropological Congress of Dr. Aleš Hrdlička, here, in Humpolec. It has been 50 years since the first of these congresses was organized to celebrate the 100th anniversary of Hrdlička's birth.

I am lucky that I had the opportunity to attend and organize almost all of Hrdlička's congresses. I have attended many conferences and professional meetings in my career, and you can believe me, Hrdlička's anthropological congresses are absolutely exceptional, both professionally and socially.

The ten-year interval between congresses provides a certain uniqueness, because 10 years is a relatively long time in science, during which the scientific paradigm can be completely altered. Thus, messages presented at each congress acquire a hallmark of uniqueness… after all, the scientific approach to a particular issue may be totally different for each following Hrdlička's congress. Hrdlička's congresses are thus the fundamental meeting places of the best researchers representing all the fields of anthropology. And so I perfectly remember (and I believe that not only I) each of these congresses.

In my memory, I have received some of the most interesting and surprising scientific messages, and met with great scientists, which often gave rise to lifelong friendships. And so Hrdlička's congresses have actually accompanied me throughout my whole professional life. And today, here at my last Hrdlička's congress, I give my last presentation and conclude my scientific career. I am sure you can understand that my last professional message simply has to be devoted to the history of Hrdlička's congresses.

Please allow me to thank the representatives from Humpolec for their effort in the preservation of Hrdlicka's legacy and co-organization of these congresses, the latter of which has helped the development of anthropology itself. I extend my thanks to the Czech Anthropological Society, which, together with the town of Humpolec, is the main organizer of the congresses. I also want to express my deepest gratitude to everyone who has ever participated in the organization of Hrdlička's congresses. I greatly appreciate your commitment. And last, I would

like to thank all the scientists attending the congress for their high-quality presentations and posters that contribute to the prestige of the congress.

Finally, I would like to make one wish. I wish for this beautiful tradition to persist and remain as a place for significant professional and personal meetings, and unforgettable events.

I wish you successful scientific meetings and a pleasant stay in Humpolec.

Thank you.

Acknowledgement: Many thanks to Katka Chmelíková for English translation and long lasting support.

Opening speech of

Professor Josef Hyánek, MD, DSc

Honorary president of the Society for Connective Tissues Czech Medical Association J.E. Purkynje Hospital Homolka Prague, Czech Republic

Dominae honoratae, domini honorati, collegi carissimi!

Liceat mihi in nomine Societatis Structuras Conjunctivales Bohaemicae et delegati in nomine Societatis Medicorum Republicae Bohemicae J. E. Purkynje hic in urbi Humpolicensi – salutem honoremque nostri Sexti Congressi archeologici internationali ad occasionem centum quinquaginta dies natali Dr. Ales Hrdlicka – cordialiter favere.

Hoc sermo signum sit summorum operum, que omni tempore valetudini nostrorum aegrotorum atque collaboratione doctorum inter omnes gentes in studiis archaelogicis atque metabolicis tota mente dedimus!

Salvete atque valete!

Dear friends!

You surely have brilliantly understood my ceremony introduction speech in Latin for the opening ceremony of the 6th International Anthropological Congress of doctor Aleš Hrdlička, 2019. Let me deliver this speech, as the Vice-president of Czech Society for Connective Tissues, the Delegate of all Czech Medical Association of J. E. Purkynje and me as the old-fashioned product of humanistic education in Latin and Greek of the last century.

In the same spirit we could continue all our further sessions dedicated to the 150th birthday of Dr. Hrdlička here, at his birthplace Humpolec. But our enlightened emperor Josef II (educated by French realists) didn't abolish Latin as the communicative language between scientists and philosophers 3 centuries ago. He ordered to use the living language German and he permitted only theologists to use hateful Latin. 2 centuries later all scientists step wise accepted English, the language of the most imperial and powerful country, for their communication language, because it is easier and shorter.

Dr. Hrdlička proved that „all mankind is of one origin", therefore we are always able to communicate and you all agree with me to continue in English, since Dr. Hrdlička was and

is worldwide respected scientist. Let me please as the Czech speaking Moravian to greet you here, where Hrdlička was born 150 years ago. It is near the borderline between Czech and Moravia. These 2 independent historical lands were occupied by Austrian Kingdom for 300 years. We all are patriots and we all are very proud of Dr. Hrdlička.

Salvete atque valete!

Scientists Awarded by Hrdlička's memorial medals

Professor Jane E. Buikstra, Dr, PhD

born 1945

Jane Buikstra (PhD U of Chicago, 1972) is Regents' Professor of Bioarchaeology and Founding Director, Center for Bioarchaeological Research, in the School of Human Evolution and Social Change at Arizona State University. Professor Buikstra is a member of the National Academy of Sciences (elected 1987) and past president of the American Association of Physical Anthropologists, the American Anthropological Association and the Paleopathology Association. She is also president of the Center for American Archeology. Among other honors, Dr. Buikstra was awarded the Pomerance Award for Scientific Contributions to Archaeology by the Archaeological Institute of America (2005), the T. Dale Stewart Award by the American Academy of Forensic Sciences (2008), the Charles R. Darwin Lifetime Achievement Award from the American Association of Physical Anthropologists (2008). In 2011, she received the Eve Cockburn Award for Service from the Paleopathology Association, in 2014 an honorary Doctor of Science Degree from Durham University (UK), in 2016 The Lloyd Cotsen Prize for Lifetime Achievement in World Archaeology, in 2018 The University of Pennsylvania Museum of Archaeology and Anthropology, Lucy Wharton Drexel Medal, and in 2018, the Gorjanovic-Kramberger Medal in Anthropology, Croatian Society of Anthropology.

Dr. Buikstra defined the discipline of bioarchaeology, an international field that enriches archaeological knowledge of past peoples with forensics, pathology, medicine, population studies, bio-geochemistry and genetics. Her research encompasses bioarchaeology, paleopathology, forensic anthropology and paleodemography, and spans North America, the Iberian Peninsula, Colonial Argentina, the west-central Andes and Mayan Mesoamerica.

She has published more than 20 books and 150 articles and has mentored more than 55 doctoral students. Professor Buikstra is the inaugural editor-in-chief of the International Journal of Paleopathology. Among her current research projects she is investigating the evolutionary history of ancient tuberculosis in the Americas based on archaeologically-recovered pathogen DNA. She is also Project Director for the Phaleron Bioarchaeological Project in Athens, Greece.

Professor Maria Kaczmarek, MSc, DSc

born 7.12.1951

Current position

Full professor of Biological Sciences
Head of the Department of Human Biological Development, Institute of Anthropology, Faculty of Biology, Adam Mickiewicz University (AMU);
teaching 25%, research 65%, administration 10%

Education and degree awarded

2007 Professor of Biological Sciences
1996 DSc degree in Biological Sciences, Anthropology, AMU
1983 PhD degree in Natural Sciences, Anthropology, AMU
1974 MSc in Biology, Anthropology, AMU

Professional Activities

2013	Visiting Professor, Comenius University, Bratislava, Slovakia
2005–2012	Biennial IP visit to Vilnius University, Lithuania
2009–	Full Professor, Adam Mickiewicz University
2008–2011	Manager of the Adolescent Health Research Group, Institute of Anthropology, Faculty of Biology, AMU
2002–2005	Vice Dean for research and international cooperation, Faculty of Biology, AMU in Poznań
2000–2007	Manager of the Human Ageing Research Group, Institute of Anthropology, Faculty of Biology, AMU
2001–2004	Manager of the project Women Health in Midlife (WOMID), Institute of Anthropology, Faculty of Biology, AMU
2001–2002	Deputy Director of the Institute of Anthropology, Faculty of Biology, AMU in Poznań
1997–2006	Associate Professor, AMU
1989, 1990	Post doctoral research The Hebrew University, Hadassah School of Dental Medicine, Israel

1984, 1986 Post doctoral fellowship The Johannes Gutenberg University, Mainz, Germany
1984–2005 Assistant Professor, AMU
1986–2001 Archeological field work, Kadero, Sudan expert in biological/forensic anthropology
1989–2008 Archeological field work, various sites, Egypt expert in biological/forensic anthropology

Research interest

My main research interests lie in the fields of human auxology, epidemiological auxology, and reproductive ecology. Current topics of my research include: (i) a prospective study on physical growth, somatic and psycho-emotional responses to stressful stimuli, and health-related quality of life of preschool children aged 3 to 6; (ii) human adolescence: an updated study methodology, growth in physique and biological maturation, physical performance and fitness, general health status and diseases, indication of risk factors for developing obesity and elevated blood pressure, health-related quality of life and underlying socioeconomic and psychosocial stressors; (iii) study on biological, endocrine and clinical aspects of menopausal transition and underlying genetic polymorphism, other biological and non-biological factors; trends over time in female reproductive patterns and associated factors; biomedical aspects of well-being in midlife.

Teaching experience

Developed and delivered university courses i.e. lectures, seminars, workshops on many topics in physical anthropology and human biology including: various aspects of physical growth, phylogenetic and ontogenetic growth and development of human brain, biological and sexual maturation; individual growth curve modeling and data analysis; modulatory effects of social and lifestyle factors on physical growth and health-related behaviours; epigenetic effects on postnatal physical growth and development; various aspects of midlife physiology including female menopause and male andropause; reproductive ecology. Courses for students in Biology, Biotechnology, Neurobiology, and the Erasmus Exchange Programme. Supervisor of 148 Master's and 12 Bachelor's theses since 1996.

Professor Ivo Mařík, MD, PhD

born 6.2.1950, married, five children

Ivo Mařík is concerned more than 35 years with problems of congenital and acquired defects of locomotor apparatus from the diagnostic and therapeutic point of view and in research on connective tissues from biomechanical point of view particularly.

In Czech Republic he elaborated the methods of conservative and surgical therapy of osteogenesis imperfecta and he was one of the first who started to use the method of prolongation of long bones according to Ilizarov and gained meaningful results in children. In 1994, after 15 years of clinical and research practice, he became the founder and head of the Centre for Defects of Locomotor Apparatus in Prague that he leads and where he guides his pupils up to now. In the turn of the 20th century he introduced total and partial drilling epiphysiodesis for leg length discrepancies treatment. His team assures comprehensive treatment for patients with genetic skeletal disorders and acquired deformities of limbs and spine in the fields Orthopaedic Surgery, Orthopaedic Prosthetics, Osteology, and Paediatrics.

He currently also works at the Department of rehabilitation, University of West Bohemia in Pilsen. Ivo does research in Biomedical Engineering, Clinical Anthropology and Genetic Skeletal Disorders. Continuing and current projects of the Centre for Defects of Locomotor Apparatus are Comparison of phenotype and genotype in patients with osteogenesis imperfecta, Measurement of spinal and postural deformities from radiographs and reading from photographs, Drilling hemi-epiphysiodesis as a method of choice for leg deformity correction, Treatment of leg length discrepancy by drilling epiphysiodesis, Kinematic analysis of walking in patients with different weight of prosthesis, Characteristics of the tibiofemoral angle, rear foot angle and plantar arch in healthy children, Growth data of Czech achondroplasia patients and new project Growth data of Czech patients with hypophosphatemic rickets.

In 2003, he defended a habilitation work „Systemic, limb and combined defects of the skeleton: diagnostic, therapeutic and biomechanical aspects“ (in Czech) at the Department of

Anthropology and Human Genetics, The Faculty of Science, Charles University in Prague and was appointed associate professor of Anthropology in 2005. He gave the basis for a new branch of anthropology called "Orthopaedic anthropology". It was one of the main topics of the Vth International Anthropological Congress of Ales Hrdlicka in 2009.

In 2016, he received appointment to a professorship of Biomechanics by president Miloš Zeman, defence before the scientific board of The Faculty of Physical Education and Sport, Charles University in Prague in 2015.

He published over 130 papers in various scientific periodical journals, delivered more than 400 lectures at the conferences, symposia, congresses and/or short study stays at home and abroad.

Elizaveta Valentinovna Veselovskaya, MSc, DSc

born 9.7.1957

Education

Institute of Ethnology and Anthropology, Academy of Sciences: Dsc 10/2016 (Doctor of historical Sciences)

Institute of Ethnology and Anthropology, Academy of Sciences: PhD 9/1989 (Candidate of Biological Sciences) Moscow State University

Department of Biology, Cathedra of Physical Anthropology: MA, 6/1980

Doctoral paper

Anthropological reconstruction of a person's appearance. Development and application of new methodical approaches

Dissertation paper

Investigation of the thickness of soft tissues by facial zones.

M.A.Paper

Study of genetic diversity of native American populations.

Employment

Institute of Ethnology and Anthropology
Russian Academy of Sciences, Head of the Laboratory of Anthropological reconstruction
Leader Scientific Researcher 5/2013–Present
Senior Researcher 5/1996–4/2013
Research fellow 6/1989–5/1996
Minor research fellow 5/1982–5/1989
Institute of Common Genetics RAS
Post-graduated Student, 8/1980–5/1982

Knowledge of foreign languages

read and can explain – English
read and can explain – Spanish

The field of scientific interest

Craniofacial reconstruction
Craniofacial identification
Anthropological study of modern population and fossil remains for solving the problems of the differentiation of morphological types. Skull and face asymmetry. Interrelationships between physical, psychological and genetic characteristics in modern population.

In a whole

Articles – 163
Participation in Books – 12
Anthropological reconstructions: sculptural – 65
Graphic – 210
Forensic reconstructions – 140

Field investigations

Burjatia, Lithuania, Eastern Siberia, Middle Asia, Caucuses and European part of Russia. Investigations of modern population – about 6 000 individuals.

Presented papers on 44 International Conferences and Congresses.
Professor in the Russian State University for Humanities.
Member of European Association of Anthropologists.

Alena Němečková, Dr

born 1946

It has been over forty years since Alena Němečková (graduate of the Faculty of Science at Palacký University in Olomouc) joined the Institute of histology and embryology of the Faculty of Medicine of Charles University in Pilsen.

In 1974, she completed a dissertation of plant tissues and continued in a laboratory microscopic technique to process ancient tissues. She introduced enhanced methods into the laboratory technique of mummified tissues and was dedicated to the processing of hard tissues of fossil material. Gradually, she went from studying classic preparations for light microscopy to electron and confocal microscopy techniques. Her work demonstrates that diagnostic results can be achieved on anthropological material.

Dr. Němečková founded a Palaeohistological laboratory in 1977, the only one in the Czech Republic so far. The lab focuses on the diagnosis of skeletal tumours, not only on anthropological material from Egypt, but also from various European sites. There was a very fruitful collaboration with leading Czech anthropologist Professor Strouhal – attending scientific conventions, and more than 50 scientific works with palaeohistological issues were produced. These two authors published the book "Did ancient people even suffer from tumors? History and paleopathy of tumors, especially malignant ones." Dr. Němečková also worked with Professor Vlček on historically rare material (Jan Luxembourg, Albrecht of Valdstein, B. Smetana).

Dr. Němečková is intensely involved in teaching students. She has lectures on palaeohistology. She digitizes collections of histological preparations for students and creates a digital atlas for them, where bone tissues are also included.

Assoc. Professor Petr Sedlak, PhD

born 1969

He was born in Ústí nad Orlicí, where after finishing elementary school he graduated Gymnázium. Then he was admitted to the Faculty of Science of Palacký University in Olomouc. As a diploma project, he chose the issue of biological maturity assessment by the proportional age method, which brought him closer to anthropology with a biomedical focus. After completing his master's degree he was admitted to an internal doctoral study of anthropology in a biomedical program at the Department of Anthropology, Faculty of Science, Charles University. During his studies, he completed a ten-month internship at the Pediatric Clinic Karls-Ruprech Universitat in Heidelberg, Department of Child Endocrinology, where he began to work on auxological diagnostics. After completing his postgraduate studies in 1998, he started to work as a lecturer at the Department of Anthropology and Human Genetics, Faculty of Science, Prague. In 2011 he habilitated at the Palacký University in Olomouc in the field of kinanthropology.

Currently, besides being the Faculty of Science, he is also a associate professor at the Third Medical Faculty of Charles University for preventive medicine. He has been actively engaged in the diagnosis of growth and developmental disorders for over 10 years and is an auxologist at the Endokrinological Institute in Prague and the pediatric endocrinology department at Hospital Na Homolce. The scientific and research focus is mainly directed on the physiology of growth and development of the child, secular changes, childhood obesity, etc.

In recent years, his team has been intensively researched the consequences of hypokinesis on the growth and development of children and adolescents, changes in pelvic morphology due to adipose estrogenization in boys and changes in body composition in the context of body mass proportionality in childhood, where they described the so-called hidden, or latent, obesity phenomenon. He is the author or co-author of one monograph, 6 chapters in monographs, 11 impacted publications and 27 articles in peer-reviewed journals.

Abstracts of plenary sessions – Oral presentations

"… a pyramid that stands on its point "– Ales (Alois) Hrdlicka's vision of research in physical anthropology."

Jane E. Buikstra[1]

[1] Center for Bioarchaeological Research, Arizona State University, Tempe, USA

We gather here in Humpolec to celebrate the 150th anniversary of Alois (Ales) Hrdlicka's birth. Hrdlicka, as we know, formed and transformed Americanist physical (biological) anthropology and allied fields and authoritatively addressed many issues of global significance for characterizing humankind's evolutionary history. A century ago, in 1919, Hrdlicka was recovering from a tumultuous personal and professional year. The love of his life, his first wife, Marie Strickler (Dieudonné), had just died (October 18, 1919), and he was busily executing his plans for the *American Journal of Physical Anthropology* (AJPA), including both editing and writing to fill the four issues published that year as the first volume. In addition, he was elected to the American Philosophical Society, he served as Chairman of Section H of the American Association for the Advancement of Science, and he surveyed prehistoric archaeological sites on the southwest coast of Florida. Within a decade he would also become a driving force behind founding the American Association of Physical Anthropologists (AAPA), a vital organization of some 2,200 members today. The AJPA has an enviable impact factor for 2017 of 2.9 and is among the most highly cited journals in American anthropology. While Hrdlicka's personal tumult of 1918 was unusual, his intense professional schedule can be considered typical, which explains his scholarly visibility and impact. Recently, however, Hrdlicka's contributions have undergone critical review, and American biological anthropologists have characterized them (and him) as "racist," "sexist," and "eugenicist." In this presentation, I explore such attributions in the context of Hrdlicka's publications along with relevant archival documents. To understand his physical anthropology, I argue that we must consider not only his research methods and publications, but also his historical context, his social consciousness, his spiritualism, and especially his life history, which began 150 years ago in Humpolec, Bohemia – now, of course, the Czech Republic.

History of Congresses of dr. Aleš Hrdlička

Bláha P.[1]

[1] PALESTRA, Prague, Czech Republic

In 2019, the 6th International Anthropological Congress of doctor Aleš Hrdlička will be held in Humpolec, Czech Republic. Dr. Aleš Hrdlička was an outstanding Czech and world anthropologist. He was born on 29 March 1869 in Humpolec. In 1882 he and his parents moved to the USA, where he studied medicine. He opened his private practice, but lacked the opportunity to pursue scientific work, so he accepted a position at the State Homeopathic Mental Health Hospital in Middletown. They promised him to be able to pursue his research. He first focused on anthropometry, and published his first larger study of 1,000 probands in 1895.

His publications were of interest to the professional public and he was invited to join the team of the newly established Institute of Pathology. Still wanting to deepen his knowledge, Hrdlička moved to Paris, where he studied anthropology with Manouvrier, physiology and forensic medicine, and also went to practice in several local hospitals. During his studies in Europe, he visited a number of scientific institutions in England, Belgium, Austria, Germany and Czechoslovakia, where he met Professor Jindřich Matiegka.

In 1896 Hrdlička returned to New York and continued in his scientific work. In 1910, he became curator of the Department of Physical Anthropology at the National Museum in Washington, and began to devote himself fully to the study of the Indians and undertook a number of scientific expeditions where he collected a lot of material.

Hrdlička was a great patriot and helped support Czech science. So in 1929 he founded the foundation with the aim to build the Museum of Man in Prague. This museum got his name (Hrdlička´s Museum of Man). It is located in one of the buildings of the Faculty of Science, Charles University in Prague, in Viničná street 7 and its collections contain skeletal exhibits demonstrating human phylogeny or various developmental anomalies, but also mummies. Aleš Hrdlička died on September 5, 1943 in Washington at the age of 75.

On the occasion of the centenary of Hrdlička's birth, a monument with a bust of dr. Hrdlička and a permanent exhibition was installed at the Hrdlička Museum of Man and the first ever Hrdlička anthropological congress was organized. The congress took place on 30th August – 5th September 1969 and its president was Professor Vojtěch Fetter. The opening ceremony took place at the National Museum in Prague, and scientific discussions were held in Humpolec, where 107 anthropologists attended.

This congress was followed by Hrdlička's congresses at mostly regular ten-year intervals. Their organizer is always the city of Humpolec and Czechoslovakia, respectively The Czech Anthropological Society. These congresses have gained high prestige among the professional public.

Second Congress of Anthropology of Aleš Hrdlička took place on 3–7 September 1979. The opening ceremony took place again at the National Museum in Prague and the scientific part of the congress in

Humpolec. 202 scientists from 20 countries of four continents participated, the lectures were translated into five languages and the president of the organizing committee was Prof. Vladimír Novotný.

The third Hrdlička´s congress was again very successful. A total of 212 participants presented 172 expert papers, 230 discussion papers and 19 posters. The congress took place on 3–8 September 1989 and was last opened at the National Museum in Prague. The expert meetings of 107 domestic and 105 foreign researchers were again held in Humpolec and the president of the congress was Professor V. Novotný. The "Proceedings of the Dr. Aleš Hrdlička in Humpolec" were published on the occasion of this congress.

In 1993, the Czech Anthropological Society and the Slovak Anthropological Society organized on the occasion of 150 anniversary of death of doctor Aleš Hrdlička an extraordinary congress, which took place at the Faculty of Mathematics and Physics of Charles University in Prague – Troja, with the participation of several foreign experts. The conference was organized in Czech and English and was attended by 109 researchers.

Between 1999 and 2009, following the agreement of the City of Humpolec and the Czech Anthropological Society, the dramaturgy of congresses was changed so that the opening ceremonies and scientific meetings took place in Prague and a one-day external meeting was held in Humpolec as the "Hrdlička Memorial". The program was usually followed by social events. Since 1999, the official language of all Hrdlička's congresses is English.

IV. International Anthropological Congress of Aleš Hrdlička with the subtitle "World Anthropology at the Turn of the Centuries" took place from August 31 to September 4, 1999. The scientific president of the congress was prof. Phillip Valentine Tobias of the University of Witwaterstrand, South Africa, who received the honorary doctorate of Charles University on September 16, 1999. The organizing president was assoc. prof. RNDr. Pavel Bláha, PhD, who was in charge of organizational management of the following congresses until 2009. The fourth congress was attended by 320 participants from 32 countries. On this occasion, the Karolinum Publishing House gave a report by prof. Tobias named „Hrdlička and Hominids, Human Evolution Science at the Turn of the Century" and his speech given at the award of the honorary doctorate of Charles University.

At the congress in 1999, Professor Phillip Valentine Tobias lamented that the next Hrdlička congress would be ten years from now, which is a long time for a man of his age, and he would very much like to attend another Hrdlička congress. The organizers agreed to hold an extraordinary congress on the 60th anniversary of Hrdlička's death. This congress was held on 30th August – 24th May 2003 under the name "International Anthropological Congress – Anthropology and Society" and its president was again Professor Phillip Valentine Tobias. The congress was attended by 260 scientists from 22 countries around the world. The meeting of the council of European Anthropological Association (EAA) took place in Prague during the Hrdlicka congresses in 1999 and 2003.

The V. International Congress of Aleš Hrdlička with the subtitle "Quo vadis homo… societas humana?" took place on 2–5 September 2009 and was a celebration of the 140th anniversary of Hrdlička's birth. The congress was attended by 250 researchers from 30 countries.

In 2019 we will celebrate the 150th anniversary of Hrdlička's birth and the 50th anniversary of the first Hrdlička anthropological congress. Already VI. International Anthropological Congress of Aleš

Hrdlička will be held on 3–5 September 2019 in Humpolec and its honorary president will be Assoc. Prof. RNDr. Pavel Bláha, PhD Pavel Bláha´s scientific life is associated with the organization of almost all Hrdlička congresses. The subtitle of the congress is for Dr. Ales Hrdlicka and current world events typical: "All Mankind is of One Origin."

Hrdlička congresses are traditionally associated with the awarding of Hrdlička's medals. These were first awarded in 1959 to Hrdlička's 90th unlived birthday. These are medals of high artistic value created by the sculptor Milan Knobloch, who is also the author of Hrdlička's bust. On the obverse of the medal is Hrdlička's portrait of the left profile, on the reverse is a skull of Neanderthal type and open caliper, which dr. Hrdlička designed by himself. The medal also features the most famous Hrdlicka's statement in English and Czech: "All mankind is of one origin" and „Všechno lidstvo je jednoho původu". Medals are awarded on the occasion of the Hrdlička´s congresses and other significant events associated with the person of dr. Hrdlička. They are traditionally handed over in Humpolec by the mayor of the city to prominent Czech and foreign researchers in the field of anthropology and also to important personalities of social life. Several Hrdlička's medals were also awarded to institutions such as the National Museum, etc. Medals are awarded relatively rarely, since 1959 were awarded 165 people, so medals have extraordinary value for their holders.

Dr. Aleš Hrdlička has done a lot for Czech and world science. It is the duty of the next generation of young anthropologists to continue to preserve and cultivate his legacy. Let us believe that the wonderful tradition of Hrdlička's anthropological congresses will be preserved in the next decades and that their high professional and social prestige will continue to grow.

Acknowledgement: Many thanks to Olga Hudáková, MD, PhD for English translation.

Bronze memorial tablet "All mankind is of one origin" delineates Neanderthal skull from Rhodesia.

Bronze a commemorative medal "Dr. Aleš Hrdlička - worldwide anthropologist" manufactured by Prague sculptor Milan Knobloch in 1959.

Historie Hrdličkových kongresů

Bláha P.[1]

[1] PALESTRA, Praha, Česká republika

V roce 2019 se bude konat již šestý mezinárodní antropologický kongres dr. Aleše Hrdličky. Dr. Aleš Hrdlička byl významný m českým a světovým antropologem. Narodil se 29. 3. 1869 v Humpolci. V roce 1882 se s rodiči přestěhovat do USA, kde vystudoval medicínu. Otevřel si soukromou praxi, ale chyběla mu možnost věnovat se vědecké práci a tak přijal místo ve Státní homeopatické nemocnici pro duševně nemocné v Middletownu, kde mu slíbili, že bude mít možnost věnovat se svým výzkumům. Nejdříve se věno v al antropometrii, první rozsáhlejší studii na 1000 probandech publikoval v roce 1895.

Jeho publikace vzbudily u odborné veřejnosti zájem a tak byl přizván do týmu nově vznikajícího Patologického ústavu. Hrdlička se chtěl ale prohloubit své znalosti, a tak se přestěhoval do Paříže, kde studoval antropologii u Manouvriera, fyziologii a forenzní medicínu a zároveň docházel na praxe do několika zdejších nemocnic. Během svých studií v Evropě navštívil řadu vědeckých institucí v Anglii, Belgii, Rakousku, Německu a Československu, kde se setkal s profesorem Jindřichem Matiegkou.

V roce 1896 se Hrdlička vrátil do New Yourku a pokračoval ve své vědecké práci. V roce 1910 získal místo kurátora Oddělení fyzické antropologie v Národním muzeu ve Washingtonu a začal se naplno věnovat studiu Indiánů a podnikl řadu vědeckých expedic, kde posbíral mnoho materiálu.

Hrdlička byl velkým vlastencem a chtěl co nejvíce podporovat českou vědu, a tak v roce 1929 založil nadaci, jejímž cílem bylo vybudovat Muzeum člověka v Praze. Toto muzeum získalo jeho jméno (Hrdličkovo muzeum člověka) je umístěno v jedné z budov Přírodovědecké fakulty Univerzity Karlovy v Praze, ve Viničné ulici 7, a v jeho sbírkách jsou cenné kosterní exponáty dokládající fylogenezi člověka či různé vývojové odchylky, ale také například mumie. Dr. Aleš Hrdlička zemřel 5. září 1943 ve Washingtonu ve věku 75 let.

Při příležitosti oslav stého výročí Hrdličkova narození byl odhalen pomník s bustou dr. Hrdličky, instalována stála expozice v Hrdličkově muzeu člověka a byl uspořádán vůbec první Hrdličkův antropologický kongres. Kongres se uskutečnil ve dnech 30. 8. – 5. 9. 1969 a jeho prezidentem byl prof. Vojtěch Fetter. Slavnostní zahájení proběhlo v Národním muzeu v Praze, vědecká jednání pak probíhala v Humpolci a zúčastnilo se jich 107 antropologů.

Na tento kongres pak navázaly většinou v pravidelných desetiletých intervalech další Hrdličkovy kongresy. Jejich organizátorem je vždy město Humpolec a Československá, resp. Česká společnost antropologická a kongresy si vydobyly u odborné veřejnosti vysokou prestiž.

Druhý antropologický kongres Dr. Aleše Hrdličky se uskutečnil ve dnech 3. – 7. 9. 1979. Opět proběhlo slavnostní zahájení v Národním muzeu v Praze a vědecká část kongresu v Humpolci. Zúčastnilo se 202 vědců z 20 zemí čtyř kontinentů, sdělení byla překládána do pěti jazyků a prezidentem organizačního výboru byl prof. Vladimír Novotný.

Třetí Hrdličkův kongres byl opět velmi úspěšný. Celkem 212 účastníků předneslo 172 odborných sdělení, 230 diskusních příspěvků a vystavilo 19 posterů. Kongres se konal ve dnech 3. – 8. 9. 1989 a byl naposledy zahájen v Národním muzeu v Praze. Odborná jednání 107 domácích a 105 zahraničních badatelů pak znovu proběhla v Humpolci a prezidentem kongresu byl opět prof. Novotný. U příležitosti konání tohoto kongresu byl vydán „Sborník Muzea Dr. Aleše Hrdličky v Humpolci".

V roce 1993 uspořádaly Česká společnost antropologická a Slovenská společnost antropologická u příležitosti stopadesátého výročí úmrtí Dr. Hrdličky mimořádný kongres, který se konal na půdě Matematicko-fyzikální fakulty Univerzity Karlovy v Praze – Troji za účasti několika zahraničních odborníků. Konference byla organizována v českém i anglickém jazyce a zúčastnilo se jí 109 badatelů.

V letech 1999 až 2009 byla po dohodě města Humpolce a České společnosti antropologické pozměněna dramaturgie kongresů tak, že slavnostní zahájení i vědecká jednání probíhala v Praze a v Humpolci se konalo jednodenní výjezdní zasedání jako „Memoriál Dr. A. Hrdličky", na které zpravidla navazovaly společenské akce. Od roku 1999 je oficiálním jednacím jazykem všech Hrdličkových kongresů angličtina.

IV. Mezinárodní antropologický kongres Dr. Aleše Hrdličky s podtitulem „World Anthropology at the Turn of the Centuries" se uskutečnil ve dnech 31. 8. – 4. 9. 1999. Vědeckým prezidentem kongresu byl prof. Phillip Valentine Tobias z University of Witwaterstrand, South Africa, který převzal 16. září 1999 čestný doktorát Univerzity Karlovy. Organizačním prezidentem byl doc. RNDr. Pavel Bláha, CSc., který měl na starosti organizační vedení i následujících kongresů až do roku 2009. Čtvrtého kongresu se zúčastnilo 320 účastníků ze 32 zemí a při jeho příležitosti vydalo Nakladatelství Karolinum referát prof. P. V. Tobiase „Hrdlička and Hominids, Human Evolution Science at the Turn of the Century" a jeho projev, který pronesl při udělení zmíněného čestného doktorátu Univerzity Karlovy.

Na kongresu v roce 1999 si prof. Tobias posteskl, že další Hrdličkův kongres bude až za deset let, což je pro člověka v jeho věku dlouhá doba a on by se velmi rád ještě jednoho Hrdličkova kongresu zúčastnil. Organizátoři se tedy dohodli, že uspořádají mimořádný kongres k 60. výročí Hrdličkova úmrtí. Tento kongres se konal ve dnech 30. 8. – 4. 5. 2003 pod názvem „International Anthropological Congress – Anthropology and Society" a jeho prezidentem byl opět prof. Phillip Valentine Tobias. Kongresu se zúčastnilo 260 vědců z 22 zemí celého světa. Při kongresech v letech 1999 a 2003 proběhlo v Praze zasedání koncilu Evropské antropologické asociace (EAA).

Pátý mezinárodní kongres Dr. Aleše Hrdličky s podtitulem „Quo vadis homo… societas humana?" se uskutečnil ve dnech 2. – 5. 9. 2009 a byl oslavou 140. výročí Hrdličkova narození. Kongresu se zúčastnilo 250 badatelů z 30 zemí.

V roce 2019 oslavíme 150. výročí Hrdličkova narození a zároveň 50. výročí od konání prvního Hrdličkova antropologického kongresu. Již VI. Mezinárodní antropologický kongres Dr. Aleše Hrdličky se bude konat ve dnech 3. – 5. 9. 2019 v Humpolci a jeho čestným prezidentem bude doc. RNDr. Pavel Bláha, CSc., který je spjat s organizací téměř všech Hrdličkových kongresů. Podtitul kongresu je pro Dr. Aleše Hrdličku i současné světové dění příznačný: „All Mankind is of One Origin."

S Hrdličkovými kongresy se již tradičně pojí předávání Hrdličkových medailí. Ty byly poprvé uděleny v roce 1959 k Hrdličkovým nedožitým 90. narozeninám. Jde o medaile vysoké umělecké hodnoty

vytvořené podle návrhu sochaře Milana Knoblocha, který je také autorem Hrdličkovy busty. Na lícové straně medaile je Hrdličkova podobizna z levého profilu, na rubu je lebka neandrtálského typu a rozevřený kaliper, který dr. Hrdlička sám navrhl. Na medaili je také nejslavnější Hrdličkova věta v angličtině a češtině: „All mankind is of one origin" a „Všechno lidstvo je jednoho původu". Medaile jsou udělovány u příležitosti konání Hrdličkových kongresů a jiných význačných událostí spojených s osobou dr. Hrdličky. Jsou tradičně předávány v Humpolci starostou města význačným českým i zahraničním badatelům v oboru antropologie a rovněž významným osobnostem společenského života. Několik Hrdličkových medailí bylo uděleno i institucím jako např. Národnímu muzeu, apod. Medaile jsou udělovány poměrně zřídka, od roku 1959 jich bylo uděleno 165, mají tedy pro své nositele mimořádnou hodnotu.

Dr. Aleš Hrdlička udělal pro českou i světovou vědu mnoho. Je nepsanou povinností nastupující generace mladých antropologů jeho odkaz i nadále uchovávat a pěstovat. Věříme, že nádherná tradice Hrdličkových antropologických kongresů bude zachována i v dalších desetiletích a že jejich vysoká odborná i společenská prestiž nadále poroste.

Female reproductive potential throughout the lifespan: an anthropological perspective

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The female reproductive potential and its management have attracted a great deal of interest in the past decades for a number of reasons. Among several others, life expectancy has progressively and unbroken increased from about 56 years at the turn of the 20th century to around 80 years at present. It means that for women who reach menopause at age 51, one third or more is now spent after fertility years. However, the trade-off laid ahead longer lives is the increased risk of severe ill-health or disability. It makes the challenges faced now in the sector of global health much more complex. The delay in childbearing, associated with reduced fertility and adverse pregnancy outcomes contributes to an increasing incidence of infertility and assisted reproduction treatment.

On the basis of literature currently indexed and abstracted in MEDLINE, SCOPUS and Google Scholars and own research data, this review aims to provide a comprehensive picture of changes in the female reproductive capacities across the lifespan and to explain biological mechanisms underlying these changes.

The first part of this review addresses major reproductive changes in the female lifespan, as well as intra- and inter-individual variability. They include: formation of primordial follicles to establish a reservoir of resting follicles during embryonic development and the ovarian pool of follicles at birth; postnatally, childhood when the reproductive system is quiescent; puberty, the transition between childhood and sexual maturity with menarche as the significant event of this maturation; reproductive period that commonly lasts from about 13 to 51 years and is characterized by menstrual cycles occurring once a month and interrupted by pregnancy, and the transition from the fertile period to the infertile phase heralded by menopause, the irreversible end of reproductive capacity. The last but not least is the postmenopausal life, a unique human feature among primates.

The second part is focused on explanation of the current pattern of female reproductive capacity. At the proximate explanation, immediate genetic, endocrine, metabolic, and environmental correlates of turning points in female reproductive trajectory were described. At the ultimate level, we used evolutionary theory to understand changes in reproductive capacity as part of an overall reproductive strategy designed to maximize reproductive success.

A comprehensive view on changes in the reproductive pattern across lifespan, inter-individual variability, and importantly, taking an evolutionary approach may facilitate new ways of thinking about reproductive health an important component of general health.

Russian school of anthropological reconstruction. Recent achievements and new projects. History of anthropological reconstruction in Russia

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Skull-based facial reconstruction has a special place in anthropology: it allows the recreation of the appearance of ancient people who inhabited various regions of the world. For this purpose, a technique for craniofacial morphological reconstruction was developed in the Laboratory of Anthropological Reconstruction at the Institute of Ethnology and Anthropology of the Russian Academy of Sciences. The technique of skull-based facial reconstruction was shaped by the famous Russian scientist Mikhail Gerasimov (1907–1970). He measured the thickness of the soft tissues of frozen cadaver head sections; he carefully studied the attachment of cartilages, muscles, and ligaments by dissecting the ocular and nasal areas of the face. Years of research yielded a fundamental work describing in great detail the painstaking process of recreating the details of the morphology of the face based on the underlying structures of the facial skeleton. His student Galina Lebedinskaya (1924–2011) devoted her dissertation to the study of the nose – an important element determining facial features. When in 1970 Gerasimov passed away, Galina Lebedinskaya succeeded him as Head of the Laboratory, and continued to carry the torch for the scientific research started by Gerasimov. The Laboratory kept taking in new students: Tatyana Balueva, Elizaveta Veselovskaya, Olga Grygorieva. In 1996 Tatiana Balueva became next head of the Laboratory. She was a world renowned scientist who made significant contributions to many areas of anthropology, such as paleoanthropology and the morphology of the modern indigenous peoples of Siberia, craniofacial reconstruction and the identification of individuals by osseous fossils. Tatiana devoted most of her career to the betterment of skull-based facial reconstruction, for which the supreme methods belongs to Russia.

Since 2012, the Laboratory is headed by DSc Elizaveta Veselovskaya. The total staff of the Laboratory is 5 people.

A unique collection of portraits made on the skulls of ancient people and historical persons

Currently, the laboratory has a unique collection of sculptural and graphic portraits made by Gerasimov's method. This collection (more than 300 specimens) also includes three special exhibitions:

I. Human evolution in sculptural reconstructions: different types of the Australopithecus family; Homo rudolfensis; Homo habilis; Homo erectus from Kooby-Fora and Sangiran; several examples of Homo heidelbergensis; a lot of representatives of Homo neandertalensis from Europe and Asia; a number of portraits of the upper Paleolithic Eurasian population (Pshedmosty, Dolny Vestonitse, Markina Gora, Sungir, Arene Candide etc.).
II. Portraits of the representatives of various archaeological cultures of the Bronze, Iron, and Middle Ages (Huns, Scythians, Sarmaths, Slavs etc.).
III. Portraits of famous historical persons: Jaroslav the Wise (Prince of Kiev); great Asian warrior Timur (Tamerlane), Prince Oleg of the Ryazan principality; Ivan the Terrible, and his son, Fedor; Stepan

Krasheninnikov – a famous ethnographer of 18th century, Jodokus of Luxemburg and numerous other luminaries.

Modern achievements of the method

The method of craniofacial reconstruction is widely used in various fields of science and practice. Work on the refinement and improvement of the method continues in the Laboratory of anthropological reconstruction of the Institute of Ethnology and the Anthropology of the Russian Academy of Sciences. In recent years, a comprehensive methodological approach "Appearance Algorithm" has been developed on significant statistical material. It combines a) a step-by-step algorithm for the transition from craniological characteristics to anthropometry and anthroposcopy of a living person; b) the classification of the obtained sizes and indices into qualitative categories; c) drawing up an in vivo verbal portrait on the skull. The results of its application can be used for plastic reconstruction of the face by the skull, by anthropological comparison of the ancient and modern population, by identifying the individual by the skull, by identifying various images from the point of view of their belonging to one person. The program covers measurement characteristics, scoring characteristics, as well as qualitative and descriptive signs of the head. In addition to the data obtained by the author or with her participation, world developments in the field of corresponding the head signs to the underlying bone structures were involved in developing this approach. The "Appearance algorithm" significantly clarifies the procedure of visualization of the appearance in the form of a graphic or sculptural reconstruction and makes it possible to obtain dimensional and descriptive characteristics of the head based on the corresponding parameters of the skull.

The use of the "Appearance algorithm" allows to restore the lifetime appearance of a number of representatives of specific populations and not necessarily in the form of sculptural or graphic portraits. It is possible to obtain forms of lifetime dimensions and descriptive characteristics. Comparison of the results of such reconstruction with the modern population of the corresponding territory equips anthropologists with new tools for resolving questions of ethno genesis, adaptation of populations, and epochal variability.

Projects

The joint project with Masaryk University under the leadership of Professor Eva Drozdova: Anthropological characteristics of the Slavs from the territory of Moravia. The results of the analysis of craniological and osteological studies of the populations that left Slavonic burial sites Pohanskoe and Divaky (Moravia territory) are given in accordance with the sculptural and graphic reconstructions from these burial grounds. Using the technique of a verbal portrait on the skull allows to represent the characteristics of ancient populations in terms of anthropometry and anthroposcopy of a living person.

The joint project with Masaryk University under the leadership of Professor Eva Drozdova: Dietrichstein family. Anthropology and plastic reconstruction. The gallery of the portraits made on skulls present the different generations of this famous genus.

The goal of one of the projects was to study the interrelationships of the signs of the nasal region of the face in order to clarify the restoration of the individual elements for craniofacial reconstruction. Measurements were taken on the middle facial floor on a contingent of Moscow students (143 young men and 154 girls). The program included measuring signs of the back of the nose, the tip of the

nose, its base, the wing of the nose, and the width of the filter. For a variety of detailed signs of facial morphology, tables of the main statistical parameters for men and women were obtained, which represent an important aid in the reconstruction of the appearance. Conducted correlation analysis revealed reliable relationships between signs that do not have a bone base (dimensions of cartilage part of the nose), on the one hand, and dimensions that have a bone base (width of the back of the nose, the distance between alveolar canine eminations, etc.). Recommended regression equations for calculating the lifetime dimensions of the middle facial floor on the basis of cranial measurements. The results of the study showed that the signs of soft tissues and signs with the bone base develop in ontogenesis quite consistently. Continuing this kind of research on a homogeneous sample, as well as using computed tomograms (CT) as the primary material, can provide a more accurate reproduction of skull-based features of the appearance.

Another project was devoted just to analysing the interrelationships of the features of the mid-level face and the underlying bone structures on computer tomograms. The results obtained confirmed the effectiveness of the use of CT for anthropological reconstruction.

An integrated approach was applied to unique craniological materials from East Asia (the Neolithic burial grounds Pad Tokui, Zhindo from Transbaikalia; ainu skulls from Far East). Osteological materials were studied by a number of programs: the study of the growth processes of the brain box, classical craniology, craniofacial reconstruction, the study of the postcranial skeleton for proportions, basic loads and pathology. As a result of work on the project, new information was obtained regarding the lifetime appearance of the ancient population of Transbaikalia and Primorye, as well as about some features of craniology.

Now we are working on the album „ Russian History in Faces (based on anthropological reconstruction materials)". A gallery of reconstruction portraits of historical persons and representatives of the ancient population who lived in different epochs on the territory of modern Russia is being prepared for publication. Each portrait is accompanied by a sketch of the corresponding historical epoch.

The project of restoring the appearance of World War II warriors. One of the dead was identified as Andrei Dmitrievich Vdovin, captain, paratrooper, who died on March 29-30, 1942 near Staraya Russa, Novgorod region, Russia.

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Orthopaedic Anthropology

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The topic Orthopaedic Anthropology covers with application of pieces of knowledge on skeleton development and its functional adaptation in paediatric orthopaedics. It engages in precise verification of both congenital and acquired body and skeleton abnormalities. Deformities and disproportions and their development is verified by anthropometric, X-ray, densitometric, CT, MRI, microscopic, histological, histochemical, electron microscopic, biochemical, biomechanical, 3D scanning methods and the like. Archaeological material is suitable subject of investigation, too. Etiopathogenetic causes of skeleton abnormalities (gene mutations), growth diseases and genetic skeletal disorders are included in the topic.

The terminology Orthopaedic Anthropology was for the 1st time used by Professor Phillip V. Tobias (Johannesburg, South Africa) in 2003 when he from the status of president of „International Anthropological Congress – Anthropology and Society" (Prague-Humpolec, May 22–24, 2003) assessed the session of the Congress titled „Comprehensive approach to congenital and acquired deformities of locomotor system" by this designation. Later in 2009 Orthopaedic Anthropology was the topic of The 11th Prague-Sydney-Lublin Symposium which was held in the frame of the Vth International Anthropological Congress of Aleš Hrdlička.

Author describes his professional beginnings, remembers his teachers and colleagues who significantly influenced his clinical and scientific work at the orthopaedic clinic of Motol Teaching Hospital and later at the Center for Defects of Locomotor Apparatus in Prague.

He demonstrates a few diagnostic successes owing many years ongoing cooperation with Professor Dr. Med. K. Kozlowski, MRACR from Sydney and members of his team. Further as short case reports he shows results of surgical and comprehensive treatment of children with osteogenesis imperfecta (multiple osteotomies and intramedullary fixation), achondroplasia, other bone dysplasias and congenital limb defects and last but not least encouraging results with a method of drilling hemiepiphysiodesis as a method of choice for knee deformity correction and treatment of leg length discrepancy by drilling epiphysiodesis or by lengthening. Anthropometric examination and assessment before, during and after treatment are non substitutable not only for confirmation of diagnosis, disproporcionality (posture and segments), growth prediction, verification of surgery success but also for comparison of genotype and phenotype.

Microscopical principles for differentiation of diagenetic and pathological intra vitam changes of archaeological bone

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The present study aims to evaluate diagenetic alteration of microstructure of skeletal remains (50 cases) from 2 different burial sites and conditions (Hungarian soil grave-c 4800 BC and Prague church chamber tombs c 500 years, containing the skeletons of Czech Kings and others persons) that were compared with histological findings in human bioptic samples obtained from patients examined for different bone metabolic and genetic disorders (200 cases). Histological and histomorphometric analysis was performed on both undecalcified and decalcified thin section from iliac bone samples. The diagenetic change were evaluated using transmitted and polarized light microscopy together with histochemical staining methods. .

We confirmed that the post mortem diagenetical processes completely changed architecture of old archaeological bone tissue from the Hungarian soil grave (c 4800 BC). It produced multiple large and small empty spaces (pores), reduced collagen content in both cortical and cancellous bone and, moreover, osteons and lamellar pattern were lacking. A surprising finding was massive reduction of collagen fibres and their unusual arrangement as was observed only in decalcified histological sections. As far as we know a similar bone pattern was not described in human pathological bone disorders. In contrast, a bone from the skeleton buried in the chamber tomb had preserved the original lamellar architecture including osteoid seams occurring in osteomalacic persons. The knowledge of such diagenetic changes is important because they may obscure bone diseases developed intra vitam, and on the other hand may simulate some histological changes typical for some bone metabolic disorders. We could conclude that the diagnostic potency of histology in ancient skeleton is limited, because burial skeletal material is commonly affected by bioerosion and acidic corrosion.

Abstracts
Oral presentations – IACAH

Session 1

Dr. Aleš Hrdlička, Sociocultural anthropology

Aleš Hrdlička and racial anthropology

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The approach of Aleš Hrdlička as one of the leading representatives of American anthropology towards the concept of race, eugenics movement, Social Darwinism and its important ideological and political implications has been a subject of several scientific papers and academic debate. The main aim of the presentation is to outline the nature of Hrdlička´s interactions with the contemporary racial and eugenics movement and its highly influential advocates in a wider intellectual and historical context of the emergence and development of the racial thinking in the Western society in the last decades of the nineteenth and in the first half of the twentieth century.

Giustiniano Nicolucci, an influential but forgotten pioneer of Anthropological studies

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Giustiniano Nicolucci founded the Italian school of anthropology and the Museum of Anthropology of Naples. His essay Delle Razze Umane [On Human races], published in two volumes in 1857, was the first Italian treatise on anthropology and paleoethnology. In the history of European anthropology, among the Italian top-researchers of nineteenth century are today better know Paolo Mantegazza and Cesare Lombroso, more connected with Darwinists conception, than G. Nicolucci. The study, based on original Nicolucci's works, will present his scientific and academic biography and the main aspects of his studies in anthropology and paleoethnology.

The art of activism on Bali, Indonesia

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Activism is on the rise on Bali. The touristically heavily influenced island in the Indonesian archipelago is seeing a surge in environmentally and politically motivated activism. Whether it is more

established NGOs or single individuals: many now chose art as a form of protest. This presentation will inspect this Balinese ‚artivism', while also investigating its origins.

Research on social behavior during nightlife and entertainment in urban areas

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The presentation summarizes the basic factors that influence people's behaviour during nightlife and entertainment in urban areas and shows examples of how to manage its risk. At the same time, it notes a lower level of exploration and research at the present time compared to the end of the millennium and encourages the use of the „KaReN" research set to describe and map the current situation in more places. The current situation is different than at the end of the millennium and the current nightlife participants have different prophets and other behaviour patterns and we do not know them exactly. The information required is related to the recreational life and young people. This is a very wide and complex issue (economy, culture, sociology, music, urbanism, transport, leisure industry, recreational policies, safety, emergency rooms, …). What is envisaged is a collection of already existing and specific data for the issue being studied. The information needed can be either qualitative or quantitative. The comparison with existing data or reports of other towns can be very useful in order to prepare the conclusions and recommendations. It´s necessarily to assess a quantity of diverse practical and essential information, of diverse provenance, aimed at assessing necessities and planning intervention responses in relation to the weekend nighttime recreational contexts. To identify and assess the importance of these contexts in relation to the overall structure of the city in respect of their effects on public health and safety.

The following fields are generally of special interest (but in each case some particular field can be more relevant):

- Health (use and abuse of alcohol and drugs, emergency services attention, risky sexuality…)
- Safety (police reports, risk and violent behaviours, conflicts relating to the venues)
- Coexistence problems (neighbourhood disputes, noise, rubbish, destruction of public property)
- Transport (existence and use of the various kinds of transport, accidents, fines for driving under the influence of alcohol and drugs)
- Sociological data on the young and their lifestyles (finances, studies, employment history)
- Recreational culture (music styles, image of recreation in the press)
- Economy (growth of the recreation industry, type of venue)

The importance of group identity and social position on body height

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Body height has a signaling function among social mammals. Humans also perceive physical size as a signal and tend to associate stature and status. Taller men are perceived as more competent and authoritative. Studies in wild Kalahari male meerkats (*Suricata suricatta*) suggest that dominance itself can be a stimulus for growth allowing for competitive growth and strategic growth adjustments. Assuming that similar mechanisms on the control of growth are also relevant for humans, our understanding of the shortness of many Third World populations has to be revised. Short stature may no longer be exclusively understood as an expression of poverty, chronic malnutrition and poor health but as an expression of persistent feelings of inferiority and patronization in the face of the global spread and dominance of Western life and moral codes.

Session 2

Auxology

The Application of Typical Error of Measurement in the Assessment of Body Composition Measurement Accuracy using the DXA Method

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Introduction: To ensure proper interpretation of the achieved results (particularly in repeated measurement), it is necessary to know the accuracy of the used method (device). To express the accuracy of measurement, it is possible to use the typical error of measurement (TE) that allows for expressing the determined error in the used measuring units. The method of Dual-Energy X-Ray Absorptiometry (DXA) is now frequently used to measure body composition. Even though this method is considered referential, it is not possible to assume that it measures with absolute accuracy. The aim of the study is to verify the accuracy of the DXA method using TE through repeated measurements, performed consecutively. Material and methods: The research was implemented in a group of 63 participants (38 male, 25 female). The average age of male was 22.6±2.9; female were 21.4±2.0 years old. To measure the body composition parameters using the DXA method, we used Hologic QDR Discovery (Hologic, USA). The measured parameters included body mass (BM), fat free mass (FFM), body fat (BF), bone mineral content (BMC), bone mass density (BMD). Results: During the whole-body analysis, the determined TE was: BM at the level of 0.12 kg, BF 0.25 kg and 0.4%, BMC 19.0 g and BMD 0.01g/cm2. The ICC values of repeated measurements ranged from 1.00 to 0.99. Conclusion: We recommend using only such values that exceed the TE value to be demonstrable when interpreting the results of repeated measurements in diagnostic practice.

The research was funded by the Research Projects: SGS 02/PdF/2019-2020 - Influence of gender and age on changes in bone parameters of runners.; Program 4 HAIE - Healthy Aging in Industrial Environment (CZ.02.1.01/0.0/0.0/16_019/0000798).

Normal weight obesity in preschool and middle-school-aged children

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Normal weight obesity in children has been associated with excessive body fat, lower bone density and decreased total lean mass. However, no studies have been done into whether normal weight obese children differ in skeletal robustness or lean mass development on the extremities or motor performances from normal weight non-obese, overweight, and obese peers. The aim of this presentation is to show dramatic anthropometry differences between normal weight obese and non-obese children which are hidden to weight/height indices and further provide evidence for significantly weaker degree of fundamental motor skills of normal weight obese preschoolers.

Male obesity during adolescence, a feminine skeleton in adulthood? Longitudinal monitoring of obese individuals

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Literature focused on skeletal development in the context of obesity is limited, but it is important to highlight key premise: pathogenic effect of fat tissue on a developing individual is fundamentally different than on an adult. Several changes caused by obesity during maturation have an irreversible and severe negative effect for a whole life.

Our study was focused on monitoring of the pelvis. The adult pelvis is strongly sexually dimorphic, but that is not a case of the juvenile pelvis. Morphological differences among sexes are indistinct and start to manifest with the onset of puberty. Evidence from animal models and case studies of treatment gender dysphoria suggesting that estrogens have a stimulatory effect on the pelvic growth plates, leading to widening of the whole structure.

Male obesity is connected with hypogonadism, manifested with low levels of testosterone, and high levels of estrogens. The goal of our study was to evaluate the influence of adiposity during adolescence on the morphology of the adult pelvis in the context of hormonal status.

Our sample consisted of 243 individuals (147 females, 96 males) observed in 8 years long follow-up (mean age enrollment 15.0 years, follow-up 23.3 years). Anthropometry, body composition (using BIA) (Tanita SC-240 MA and BC-418 MA) and anamnesis were obtained. During follow-up were also collected saliva samples from male participants to estimate estradiol and testosterone levels using salivary ELISA kit (Salimetrics, LLC).

Level of adiposity during adolescence (estimated using BIA) was strongly positively correlated with relative pelvis breadths in adulthood (males $r = 0.68$, females $r = 0.62$, both with $p < 0.01$). Adulthood pelvis breadth was highly sensitive (0.79) and specific (0.75) marker of obesity during adolescence. Androgenic hormonal status was weakly negatively ($r = 0.22$, $p < 0.05$) associated with relative pelvis breadth.

We observed widening of skeletal structures of the pelvis among adults associated with adiposity levels in adolescence. Based on adult pelvis breadths can be discriminated history of obesity with high sensitivity and specificity. One of the explanations for this observation can be the influence of elevated estrogens levels connected with excessive adiposity leading to the wider pelvis. However,

the biomechanical stress connected with elevated body mass has to be also considered, as well as the physical activity.

Secular trends in body characteristics among Slovak students and adolescents during three decades

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The objective of the study was to evaluate changes in anthropometric parameters in Slovak population aged 0 to 18 years since the period of 1981.

Data were obtained from the national anthropometric surveys (NAS) Slovakia in the years 1981, 1991, 2001 and 2011 (the original data) from 0–18.9 years old boys and girls living in urban and rural areas with altogether about 260 000 participants. Body weight and circumference measures were evaluated also in relation to body height. Body mass index (BMI) was classified according to IOTF.

The medians of anthropometric parameters did not differ from the data found in NAS 1981 up to the age of 2 years. The intensity of the secular trend in height within the entire decades was differentiated by gender and age. In boys, it was most pronounced in the last decade, but in girls, this was valid only for prepubertal age. In subjects older than 14y, it stopped in 2001. Up to this year, changes of all anthropometrical parameters were proportional to changes of height. As most of the height increase occurred after 1981 along with slight weight changes, the youth population appears to be the slimmest around 1991. Whereas the final height increased by 3 cm in boys and 2 cm in girls and did not change since 2001 or 1991 respectively, about 60% of weight increment (5.5 kg) in boys, and almost 90% (0.7 kg) in girls, falls to the last decade. In addition, the hips and waist circumferences increased relatively more as compared with the chest. The prevalence of overweight and obesity doubled to a level (8–15%) and (5–10%) respectively depending on age and gender.

Secular trend in body height is limited to prepubertal and pubertal life period, more pronounced in boys. These findings should be taken into account when using different standards for evaluation of the growth. The onset of obesity "epidemic" along with the unfavorable changes in the proportionality of body parameters are relatively new phenomena in Slovakia, associated with life conditions, inappropriate diet and reducing physical activity.

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"All man kind is of one origin" in the context of modern reproductive technologies

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Hormone isolation, medical imaging methods, safe abortion, reliable and safe contraception, the possibility of manipulation with embryos and gametes, their safe and very effective freezing and thawing, analytical and gene editing methods, cloning and developing methods of artificial gametes production. The last few decades have brought absolutely fundamental changes to the understanding of human reproduction. They open up immensely complex ethical debates about what is worth and what is the worth, bringing tremendous legal problems with anchoring changes. It completely changes the basic theoretical concepts and established interpretations of commonly used professional and non-professional terms.

Children growing up with fathers who were not their genetic fathers, or mothers who did not bear them, were always there. However, the possibility of manipulating eggs and embryos has greatly increased their number and especially the complexity of relationships. Moreover, it must be taken into account that the creation of such children is socially guaranteed and legally supported. Due to the transfer of mitochondria from one egg to another, children who have two genetic mothers normally live. Human artificial gametes are not yet in clinical use and only human cells are used in their formation. But children born from genetically modified embryos were already born in 2018 in China, others are said to be on their way. It cannot be ruled out that other parts of the body or DNA other than of human origin will be used in the future for genetic manipulations.

Thus, not only anthropology is faced with the need to seek answers to what is today „origin?" What is „man kind" and what is „a man"?

Supported by the grant: GAČR 17-07753S „Surrogate motherhood in the Czech Republic: legal, psychosocial and ethical analysis".

Session 6

Anthropogenetics

Need for novel detection targets in tuberculosis diagnostics of historical specimens – bioinformatic analysis

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Diagnosis of tuberculosis from historical specimens has been mostly based on detection of IS6110 by PCR and following gel electrophoresis. Even when some authors stressed the possibility that this insertion sequence may have similar counterparts in other microorganisms (e.g. soil bacteria), it continued to be used widely, sometimes without sequencing of the PCR product. This work is aiming at IS6110 and two other sequences that are potential targets for DNA detection of Mycobacteria tuberculosis complex. These three loci are compared by bioinformatic and phylogenetic analysis to assess their usability in ancient DNA studies.

Microbial Contamination of Ancient Human Dental Calculus Studied by Scanning Electron Microscopy and Metagenomic Approach

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Dental calculus has great potential in the research of oral microbiome in past populations. Alongside the advantages of novel molecular approaches applied on ancient human dental calculus, we encounter the drawbacks as well. One of the main issues is contamination. There is a possibility of detection of microbial contamination by scanning electron microscopy prior to subsequent expensive molecular analysis. Although decontamination is always part of the workflow, the metagenomic analysis points out the residual microbial contamination. This study presents the means of detecting contamination and precautions to be taken for the best prevention of it.

Study of domestication via human dental calculus in the Early Middle Ages

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The present study will show the possibility of examination domestication via human bacterial oral flora. In the historical populations is oral microbiome preserved by human dental calculus. Samples came from the Great Moravian graveyard dated back to the 9th–10th century located in Znojmo-Hradiště (in the south of the Czech Republic). Since a huge amount of bacterial species in dental calculus, the metagenomic approach was suitable to use. Three variable regions of the 16S rRNA gene were sequenced. Results brought information regarding human oral bacterial composition as well as specific animal oral bacterial species. This makes it possible to observe the close relationship between human and animal in the Early Middle Ages. This is also supported by archaeological records.

Mitochondrial Haplogroups of Ancient Samples from Czech Republic: Comparison of two nearly Located Burial Sites

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In the field of population genetics and forensic science, mitochondrial DNA is a powerful tool for scientific research. It is a suitable method to study human origin, migration and biodiversity.

Two burial sites, Brno-Tuřany and Hroznová Lhota, are located close to each other in the Moravian region, Czech Republic. They are both dated to the Bronze Age (2000 BC), however, they belong to different cultures – the Únětice culture and the Nitra group. The aim of this study is to compare the mitogenome of the two burial locations. Several individuals representing both burial sites were analysed through high throughput sequencing on the Illumina platform, targeting only human mitochondrial DNA. Since the efficiency of sequencing of ancient samples is very low, only few samples provided complete mitogenome with satisfying coverage. Subsequently, the mitochondrial haplotypes of certain individuals were determined. Eventually, the two burial sides were analysed in the matter of origin and mutual relationship.

Genetic analysis of individuals from Vasa ship

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Vasa is a warship that sank in Stockholm Bay shortly after departure on its first voyage in 1628. In the 1950s, its wreck was discovered, including the remains of several individuals. Their skeletons were subjected to osteological analysis. The development of genetic methods has also made it possible to examine the DNA of victims of marine casualties. Thanks to the unique composition of the water in the bay, which is similar in composition to physiological saline solution, the DNA was well preserved. It was possible to extract both mitochondrial DNA and partly also nuclear DNA from the most individuals. Mitochondrial DNA analysis primarily targeted the hypervariable regions 1 and 2, and in the case of the well-preserved samples, research was extended to whole mitochondrial DNA. The target of nuclear DNA analysis was mainly loci used to sex determination. At present, this extensive research is still ongoing, data are being evaluated and the knowledge gained is placed in a historical context.

Session 7

Palaeopathology

Biomolecular paleopathology from my point of view

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Biomolecular paleopathology is of a certain importance, especially in those cases where there are no macroscopic signs of disease on bones. It uses methods based on trace elements, stable isotopes, and DNA analysis. Developments in this new field are presented below, from my point of view. In terms of the study of trace elements in bone tissue, we were the first in the Czech Republic to work on diet reconstructions of prehistoric communities using 33 trace elements, especially Zn, Sr, and Pb.

The study resulted in the identification of premature osteoporosis in the age range of 20–30 years, not only in women but also in men, in connection with the development of agriculture leading to excessive fibre intake of bran cereal. At the same time, a map of lead contamination in the Roman Empire was created.

Stable isotopes of C and N were used for further investigation concerning the diet reconstructions of the first farmers who came to South Moravia. Migration waves of the Neolithic era to Moravia were documented by using stable strontium isotopes.

By investigating plague cemeteries, especially those with specimens that lacked the typical macroscopic signatures, we were able to participate in a Europe-wide study of population genetics and migration that, based on the principles of genomic analyses, proved the evolution of plague and viral diseases and their expansion to Europe.

Hunnic migration and movement of the ymt gene proved to be critical in the origin of the plague pandemics with the bacterium pestis, also known as the plague of Justinian. Viral diseases, hepatitis B virus, causing serum hepatitis, and parvovirus B19, causing fifth disease, were proved in the early Slavonic population in Brandýsek in central Bohemia, Czech Republic. Genotypes of these viral diseases, their origin and changes were connected with human migrations.

In conclusion, it can be said that the field of paleopathology holds further significant potential for the future in the development of a new field – biomolecular paleopathology. It provides new knowledge about the evolution of bacterial as well as viral diseases.

Czech paleopathology, past and future

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The history of research in the Czech paleopathology must be sought in the mid-19th century, when J. N Čermák proved arteriosclerosis (1851) in an Egyptian mummy. In the period of the First Republic, the founder of the Czech modern anthropology, J. Matiegka followed the paleopathology, followed by E. Šimandl, J Malý and Z. Frankenberger.

It was a period of searching for the paths research should take place. In the second half of the 20th century, E. Vlček and his collaborators J. Ramba and C. Povýšil contributed significantly to know the diseases of historical personalities. M. Stloukal and L. Vyhnánek developed the population paleopathology of the Slavs and E. Strouhal and L. Vyhnánek examined the Egyptian mummies in the Czechoslovak collections by x-ray. H. Hanáková and L. Vyhnánek developed the first list of paleopathological findings from the territory of Czechoslovakia, verified until the end of the 1970s. From 1988-89 E. Strouhal and L. Vyhnánek introduced paleopathology as a teaching field at the First Medical Facultyl in Prague. L. Horáčková, E. Strouhal and L. Vargová prepared the first Czech textbook. At the beginning of the 21st century, E. Strouhal and A. Němečková focused on the study of tumors, especially malignant ones. V.Smrčka, V. Kuželka and C. Povýšil prepared a palaeopathological atlas for teaching and comparison bone preparations of limbs. The paleopathological research focused on the population of the Neolithic continued (V.Smrčka, M. Dočkalová, Z. Tvrdý), the culture of Bell-beaker culture (E. Drozdová, V. Smrčka) and Medieval and modern populations (L. Horáčková and L. Vargová) in Moravia. Genomic studies in collaboration with Copenhagen University have shown viruses of hepatitis B and Parvovirus in Slavic women from the 6th and 7th centuries (V. Smrčka and V. Kuželka). The overview shows the directions that the Czech paleopathology has followed over a period of more than 100 years.

Reconstruction of war injuries on selected skull preparations from the ossuary in Žehuň

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The lecture presents the results of reconstruction of war injuries on selected skulls from the ossuary in Žehuň. As part of our research, we first scanned the guns with a 3D scanner: a Hungarian saber, an infantry saber, a sword – Austrian cuirassier palas and a bayonet in Terezin, and then reconstructed the injuries on selected Autodesk ReCap programs. The scanned skulls were delivered by prof. MUDr. Václav Smrčka, CSc. These skull preparations come from the ossuary in Žehuň, where they were placed in a showcase on the altar. This showcase was made by local patriots: Ludmila Tvrdikova and Tamara Holoubkova. It was very likely that they were men's skulls, 20–40 year olds, or 40–50 years old, who died in the War of the Austrian Heritage (1740–1748) and the Seven Years' War (1756–1763).

The presentation will be informe about the specific characteristics of individual skulls and their injuries. There were different wounds on every skull. The injuries were unhealed, probably causing a death of individuals.

Anthropology, health and diet of Eneolithic and Bronze Age populations from Modřice (Czech Republic)

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In the extensive rescue research at Modřice (Brno-venkov district, Czech Republic) in 2015, 62 skeletons from various prehistory periods were excavated. Most of them belonged to the Early Eneolithic – Funnelbeaker culture, (FBC, cca 4000–3700 BC) (22 skeletons) and Early Bronze Age – Únětice culture (EBA, cca 2200–1700 BC) (32 skeletons). In this paper, we want to present results of anthropological and paleopathological analysis of the skeletons. In the FBC group there were 9 children, 2 juveniles, 6 males and 5 females. The EBA group consists of 7 children, 3 juveniles, 11 males and 11 females. Usual spectre of pathologies such as carries, arthrosis, inflammations including suspected TBC, and traumas were found in the skeletons. Diet reconstruction for both groups was performed using the buccal microwear analysis.

Antonine Plague: The Case Study of Epidemiological Modeling and Impact Evaluation

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Since the beginnings of the "3rd century crisis" discussions the famous epidemic called the Antonine plague has represented one of featuring factor within the range of causes. During the crisis period various segments and regions of the Roman world experienced different forms of turmoil (social unrest and uprising, economic problems, political instability etc.) or external incursions (warfare, barbarian raids). The present scientific knowledge encompasses considerable margins of estimated death toll of the epidemics. The main intention of the paper dwells is testing of possibilities of impact on the basis of emulative digital modelling and simulation. Geographically explicit context of the cellular framework represents a workspace for spatio-temporal quantitative simulation of various scenarios. Model input data include e.g. reconstructed distribution of population density, infrastructure, and historical clinical data of the respective disease. The vital part of simulation dynamics is defined through the epidemiology mathematics (a compartment model with dynamics driven by differential equations). Coping with large array of input variables, which are known only up to the limited extent, has constrained establishment of testing scenarios for assessment of possible quantitative and spatial aspects of epidemic impact within the demographic structures of the Roman Empire.

Session 9

Palaeoanthropology and varia

The taxonomic assessment of new hominin molar and premolar from Stajnia Cave (Poland)

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In this study a description concerning the morphology of the two (S16455 P4, S19415 M3) from sample of newly excavated fossil human teeth are presented. These teeth belonged to two different individuals, and together with other human teeth (S5000, S4619 and S4300) which were described as Neanderthal molars were found in Stajnia Cave (in Częstochowa Upland, in Poland). For the examined two new hominin teeth non-metric and metric data were collected according to standard methods (including e.g. the Arizona State University Dental Anthropology System (ASUDAS) supplemented by the traits described by Bailey (2002, 2006) and standard dental measurements) and more sophisticated methods (including the preparation of virtual 3D model of the dentine of the S19415 tooth). The co-occurrence of the complex morphology of the crown of S19415 M3 (the presence of six cusps with the „X" fissure pattern) with the continuous mid-trigon and anterior fovea indicate on Neanderthal affinity of this tooth. The co-occurrence of bifurcated protocone and paracone essential crests, an accessory ridge and the subvertical grooves on the mesial and distal interproximal facets in S16455 P4 also suggests a Neanderthal affinity of this tooth.

Limits of long-term selection against Neanderthal introgression

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All present-day non-Africans derive around 2% of their genomes from Neanderthals as a result of admixture between Neanderthals and anatomically modern humans approximately 55,000 years ago. It has been hypothesized that introgressed Neanderthal DNA in modern humans had been subjected to negative selection due to deleterious mutations that accumulated in the Neanderthal population as a result of their low effective population size and decreased efficacy of purifying selection (Harris and Nielsen, 2016; Juric et al., 2016). A striking observation in support of this hypothesis is a monotonic decline in Neanderthal ancestry observed in ancient modern humans from Europe over the past 45 thousand years (Fu et al., 2016). After careful evaluation of the behaviour of previously used estimators of Neanderthal ancestry, we show that this decline is likely an artefact caused by gene flow between West Eurasian and African populations, which was not taken into account by previously used

statistics. Using a more robust statistic, which avoids assumptions about the relationships between modern human populations, instead taking advantage of a recently published second high-coverage Neanderthal genome, we find no evidence for a significant decline in Neanderthal ancestry over time. In agreement with this, whole-genome simulations of a wide range of scenarios of selection and introgression show that negative selection is not expected to cause a significant ongoing decline in genome-wide Neanderthal ancestry. Nevertheless, these simulations do reproduce previously observed signals of selection against Neanderthal ancestry, such as the depletion of Neanderthal DNA in conserved regions of the genome. Strikingly, we find that this depletion is most severe in regulatory and conserved non-coding genomic regions, and in the most conserved subset of protein-coding sequences.

The evolutionary history of Denisovan and Neanderthal Y chromosomes

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Ancient DNA has allowed the study of various aspects of human history in unprecedented detail. To date, the majority of archaic human specimens well preserved enough for genome sequencing have been female. Therefore, the study of Y chromosomes of Denisovans and Neanderthals, and thereby of the paternal demographic histories of these hominin groups, has not been possible. Here we present sequences of the very first Denisovan Y chromosomes from two Denisovan individuals (Denisova 4 and Denisova 8), as well as the Y chromosomes of three late Neanderthals (Spy 94a, Mezmaiskaya 2 and El Sidrón 1253). We find that Denisovan Y chromosomes split around 630 thousand years ago from a lineage shared by Neanderthals and anatomically modern human (AMH) Y chromosomes, which diverged from each other around 300 thousand years later. This is in contrast to autosomal nuclear DNA, which places Denisovans and Neanderthals as sister groups which split from a common ancestor of AMH between 520 and 630 thousand years ago. Therefore, archaic human Y chromosomes provide new evidence for gene flow from AMH to Neanderthals which resulted in a complete replacement of Neanderthal Y chromosomes, and limit the plausible time range for this gene flow. We use population genetic simulations to show that although replacement of Y chromosomes in the Neanderthals is unlikely under neutrality, models that include differences in effective population sizes and efficacy of negative selection between Neanderthals and AMH predict a rapid fixation of non-recombining loci introgressed from AMH into Neanderthals.

Application of computed tomography in anthropological study of ancient Egyptian mummies

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Modern methods of computed and magnetic resonance tomography are used for the non-invasive study of mummification techniques, the definition of procedures and ceremonies for mummification, the determination of the gender identity and causes of death, the measurement of the anthropological characteristics, the forensic and medical examination of mummies, the creation of three-dimensional stereolithographic reconstruction. Application of these methods provides possibilities to perform research studies of mummified remains without their destruction, defrosting, unfolding the windings of mummies and the corresponding destruction of information about the mummification process. Another important advantage of computed tomography method is the ability to repeatedly examine mummies and to carry out the reconstruction of the appearance no less effectively than on the macerated cranium. This paper presents the results of a paleoanthropological study of the one of the nine Egyptian mummies, stored in the Pushkin State Museum of Fine Arts (accession number I,1a №5301), using the data obtained on the computed tomograph of the National Research Center "Kurchatov Institute". The stages and research methods are described in detail and characterized.

The sex of individual being studied is determined as female by a number of morphological characteristics of the pelvis and cranium. The biological age at the time of her death is defined as 20–25 years according to such characteristics as the overgrowth of the seams on the cranium, odontological indicators and signs on the bones of the postcranial skeleton including pelvic bones. The description of the craniological characteristics clearly demonstrates the belonging of the mummy to the Mediterranean anthropological type. Exactly this type is characterized by dolichocrania and mesocrania, gracilis, narrow-facedness, a sharp horizontal profiling and a relatively high and narrow nose. The observables of the postcranial skeleton indicate a growth below the average – 157.9 cm, a narrow pelvis, a small width of the brachii, an elongated brachii relative to the femor and a significantly shortened antebrachium.

This study was supported by the Russian Foundation for Basic Research, project no. 17-29-04144 ofi_m.

Analysis of chemical elements on surface enamel and localised enamel hypoplasia of human primary canines (LHPC) via EDX method in the Necropolis of Great Moravia in Znojmo-Hradiště (9th–10th century CE, Czech Republic)

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The present study aimed to analyse the chemical element content of the surface enamel and localised hypoplasia of the primary canine (LHPC(of the Slavic population from the 9th to the first half of the 10th century CE in the South Moravian burial ground of Znojmo-Hradiště.

The chemical element content of the enamel was analysed via the EDX method. The incidence of LHPC is very high in this analysed collection in comparison with other Slavic populations. 45.59% individuals (n=31) displayed at least one hypoplastic defect on their canines. Most individuals were 2–5 years old and more than a quarter of them had multiple hypoplasia. The EDX analysis shows the average value of the Ca/P ratio in Spectrum 1 to be highest in teeth with unsolid enamel (LHPC), decreasing to Spectrum 2 and subsequently to Spectrum 3. The concentration of phosphor is increasing from Spectrum 1 to Spectrum 3. Magnesium was most commonly present in Spectrum 1, and less often in Spectrum 2 and Spectrum 3 in mean concentration 0.27 and 0.39 at.%. Values of Mg content rise to on average 0.63 at.% on the base of hypoplastic defects. In agreement with the findings of Robinson et al. (1981), this might mean a lower density of enamel in the place of a hypoplastic defect. However, this cannot be argued clearly, because the difference in concentration could have been caused by diagenetic processes over the time that the samples lay deposited in soil. Sodium is found in our collection of teeth about as often in all three spectra in an almost identical mean concentration (0.51, 0.46 and 0.56 at.%, respectively).

Session 10

Clinical anthropology

Do the sport dance, classical ballet and Slovakian folklore dance training affect the gait stereotype?

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„There are many ways how to master the art of dance. Each dancing style differs in its load put on the dancer and may lead to specific overuse injuries and pain. The purpose of this study was to characterize the differences in gait produced by different style dancing training as the number of previous studies is limited and predominantly focused only on classical ballet. 25 sport dancers (12 females, 13 males), 22 classical ballet dancers (16 females, 6 males), 21 dancers from Slovakian folklore dance group (12 females, 10 males) and 20 non-dancers (10 females, 10 males) participated in this study. All participants were asked to walk barefoot among the Emed-at platform (Novel GmbH, Germany) at their natural gait velocity. The contact area (cm2), contact time (ms), maximal force normalized to body mass (% body mass) and peak pressure (kPa) were analysed. Additionally, the foot progression angle (°), COPI (center of pressure index), arch index, distance of COP during the roll-over pattern (cm) and foot length (cm) were obtained from analysed footprints. To compare the differences between groups, Kruskal-Wallis test was used. In this study, the gait in sport dancers was characterized by the longer contact time of the total foot, smaller force normalized to body mass at hindfoot and big toe areas and a small foot progression angle. The gait of classical ballet dancers was characterized by a high longitudinal foot arch, greater foot progression angle, and higher force normalized to body mass at the area of the big toe and second toe. The gait in Slovakian folklore dancers was characterized by a decreased longitudinal arch, increased contact area, and maximal force normalized to body mass at midfoot and a smaller foot progression angle compared to other dancing styles. Interestingly, more statistically significant differences were observed within the dancers of different styles than compared to non-dancers in this study. Future studies may explore the relationship between the dancers' gait characteristics and the specific injuries occurrence.

The physical characteristics of preschool children and school children in relation to the type of nutrition in infancy

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The aim of the study is to assess selected physical characteristics of 192 breast fed and 199 non-breastfed children aged 5, 9 and 14 years. The measured characteristics were body height, body weight, circumferences (the right arm circumference, the gluteal circumference, the waist circumference and the right thigh circumference) and skinfolds (the skinfold over the triceps, the subscapulare skinfold, the suprailiacal skinfold and the skinfold over the quadriceps). Body Mass Index (BMI) and the sum of all four skin folds were calculated as well. The results show that the differences in mean values between breast fed and non-breastfed boys and girls are statistically insignificant (rated by Student's t-test).

Maternal Stress During Pregnancy and its effect on postnatal growth in school

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Natural disasters provide excellent opportunities to examine the effects of prenatal stress on childhood outcomes because the stressors are independent of potentially confounding genetic and medical risk factors, and are relatively randomly distributed with regard to household and maternal characteristics. The aim of the study was an estimation of effect of strong prenatal maternal stress, induced by strike of tropical severe cyclone Aila in 25th May 2009 in the region of Sunderban (West Bengal, India), on growth and development of children.

Anthropometric and demographic data of two groups of children; 97 boys and 88 girls consisting of Aila-affected group, and 98 boys and 96 girls consisting control group, were collected in all primary schools on the two Islands of the Sunderban area and from the rural primary schools of the adjacent district, respectively. The populations were matched in respect of the origin, culture and language. They did not differ in socio-economic background. Two-way ANOVA with generalised linear model was employed to assess the significance of differences in anthropometric parameters between the Aila and the control group of children, allowing for birth weight and socio-economic parameters.

The Aila children showed lower body weight, BMI and mid-upper arm circumference, but accumulated more fat at lower part of trunk, assessed by skinfolds thickness. They had lower sitting height index, but higher relative lower leg length. Aila-affected children also showed lower body frame index.

The results together demonstrated that the children who were intrauterine during the cyclone showed several impairments of growth. This suggests the existence of significant and long lasting effect of prenatal stress on children's growth and development. Because of recently observed increase in intensity of extreme weather and natural phenomena, our results make contribution to understanding of their consequences within the context of human growth and development.

Dynamic observation of physical development indices of schoolchildren in the Republic of Belarus

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We introduce the results of longstanding anthropometric observations over the growth and development of 7–17 year – schoolchildren in the Republic of Belarus (about 20 thousand of people examined in the years 1996–1997 and 2006–2007). As it is shown in the comparative analysis of anthropometrical data for 10 years (researches in 1996–1997 years and 2006–2007 years) in the age range of 7–8 years there are no substantial shifts of indices of body weight and chest circumference among boys, while body weight tend to increase.

Inter-ethnic comparative analyses of physical development and puberty in schoolchildren from Belarus, Russia, Poland, Serbia, Bulgaria and Estonia carried out in the late 1990s – early 2000s showed that the most similar trends in growth dynamics were observed in the children of Belarus, Russia and Poland, regardless of their gender.

As a result, the revealed changes of physical development changes among Belarusian schoolchildren prove once again the necessity of constant monitoring of grow-ing up and development among children and teenagers.

Health benefits of Yoga: a scooping review

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Yoga is becoming more and more popular in the western world and with it, the western people are discovering its benefits. Scientists and medical doctors pursuing yoga-related research and are focusing on its ability to help prevent, heal, or alleviate specific conditions, such as heart disease, high blood pressure, asthma, diabetes, and symptoms of menopause, cancer and others.

This paper is a review of empirical studies, review and meta-analysis publications on yoga from the last few years. The first randomized trial (or high-quality experiment) on yoga was published in 1975 in The Lancet. It showed that yoga was more effective than relaxation for reducing high blood pressure. Since then, thousands of studies follow.

The field of yoga research has grown exponentially in the past 5 years, with nearly 200 studies being published annually.

Because of the huge number studies on benefits of yoga on physical and mental health, we'll focus today on only one part of our health – cardiovascular diseases.

The objective of this study is to assess the findings of selected universities and hospitals around the world in last 5-10 years, and to do a comprehensive review of the benefits of regular yoga practice. By this comprehensive research review we would like to prove that yoga can be used as a tool not only in prevention of cardiovascular diseases but also as an effective part of the treatment.

Results from this study show that yogic practices not only enhance muscular strength and body flexibility but promote and improve respiratory and cardiovascular functions. With this research which will prove the healing effects of yoga and we would like to open path for yoga practice to be used in healing practices by doctors and other medical professionals.

The Lombard Paradox: a historical perspective

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It has been observed that when standing up from a squat position or when cycling or climbing the stairs,the large muscle groups of the thigh (specifically quadriceps and hamstrings, which span both the knee and the hip joints)are simultaneously active. The co-contraction of bi-articular antagonist muscles- in order to produce the extension of the leg- is a counter intuitive and seemingly counterproductive behavior which has been assessed only recently. During the scientific revolution, in the XVII century, there seem to be no awareness of it. In the early XX century, WP Lombard, an American medical doctor, made an attempt to explain co-contraction of antagonist leg muscles, at least in qualitative terms. Since then, it has been known as the Lombard paradox. It was only in the last decades that biomechanics tried to give a thorough quantitative description of the Lombard paradox, in terms of moment arm lengths. Still, there are issues which needs to be addressed in order to understand the reasons why Nature has implemented a more complicated solution than the one involving only one-joint muscles, as it happens, for example, in robotics, with mechanical actuators. This study reviews the past and current scientific literature on this topic, in order to summarize the most up-to-date answers to the following questions: Why do we have two-joint muscles in the first place? How can the co-contraction of apparently antagonist muscles produce the extension of the leg? What are the possible implications of this paradoxical behavior for sport training and rehabilitation, especially after knee or hip surgery? Some studies suggest that paradoxical co-contraction may improve force production, motor control and anatomic integrity. A deeper understanding of the topic may help us to improve the way we think about physiotherapy, human performance, prosthesis, exoskeletons and even robotics.

Session 14

Forensic anthropology and anthropology in response to natural disasters and wars

Anthropology as the meeting ground of several disciplines: identification of remains of leaders of 1863-1864 uprisal

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In winter 2017, human remains in the territory of the Upper castle of Vilnius were found during conservation works. Archaeological contexts indicated these might be remains of leaders of anti-tsarist uprisal of 1863-1864, executed in Vilnius. In total, 21 individual were executed by fusilade or hanging. Subsequent archaeological excavations revealed 20 remains. Complex identification work was taken creating „ante-mortem" (historical/archival: sex, age, time and mode of execution, photographs and individual morphological peculiarities of a person, search for living and deceased relatives) and „post-mortem" (archaeological and anthropological: sex, biological age, stature, pathologies and other morphological individualising traits of skeletonised remains, position of inhumations, DNA profiles) „portfolios" of each individual for subsequent cross-matching. It should be noted that craniofacial superimpositions and DNA identifications were performed as „blind tests", not knowing contextual and other data. It was considered that matching of DNA was the most hard evidence; this way four individuals (for additional data, exhumations of graves of four relatives in historical cemeteries were performed; DNA also enabled to determine remains of which individual are still missing) were positively identified. Craniofacial superimposition enabled to identify (with lesser degree of probability) 6 individuals. Two extra individuals were identified also on the basis of antemortal traumas, one – on the wedding ring (besides of other data). Identity of remaining ones was determined on the basis of archaeological contexts and group identification data.

In summary, this work demonstrated that success of such study was possible only due to collaboration of historians, archaeologists, bioanthropologists and forensic experts, where anthropologists are taking the leading role due to interdisciplinarity of their methodology.

Application of SEM-EDX in forensic and historic anthropology through dental fillings

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Chemical composition of dental fillings can help to situate individuals in time and space for usage in forensic and historical connotations. In cemeteries (mainly in the modern era) it can suggest the status of people and in war graves (mainly from WWII) it can help to identify the country of origin. The main advantage of the application of SEM-EDX is a non-destructiveness. Dental fillings are left inside the tooth during analysis so it is a very appropriate approach for such a rare material. The first group of studied samples came from the cemetery from Flora-Olomouc which is dated to 1784-1901 and second group from German soldiers who died in Czechoslovakia during WWII.

The difficulty of a forensic geneticist's work

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Forensic genetics is among the youngest and rapidly evolving fields of forensic science. As the technical examination stand develops, the pace becomes faster, the results of the analyses more accurate and the data obtained more informatively voluminous. However, in the beginning, there is always human biological material from the crime scene, the quality and the quantity of which influence the outcome of the analysis. Even initial laboratory operations cannot be considered unimportant. The correct choice of insolation kit, and also the manufacturer's recommendation to increase the resulting DNA volume, is not to be neglected to comply. The final step of the analysis is to determine the DNA profile, its quality, the number of contributors and the decision whether the DNA profile is fit and suitable for comparison and subsequent individual identification of the person. The road to such a conclusion may not be easy, and a forensic geneticist may encounter many difficulties. Some of them can be solved based on knowledge or experience, some are difficult to solve due to the small amount of sample information. This contribution will be just focused on the complex moments of the forensic geneticist's work.

Wandering through Central Europe in the Middle Ages: possible burial of an Outlander

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Th is paper presents a case study of an individual from archaeological site Nitra-Školská ulica (Slovakia). Rescue archaeological examination in the central part of the town Nitra was realised from April to December 2007, revealing 50 graves dated between the turn of the 10th to 11th century and the turn of the 11th to 12th century AD.

Th e article shows abnormally tall young adult male (adultus II) with noticeable morpho-metrical signs visible on the bones. Especially postcranial skeleton manifests apparent robusticity of diaphyses of the long bones, slight medio-lateral bending of the femurs, anterior bending of distal ends of the humeri. In addition, following were observed: multiple spondylolyses of unknown aetiology on the lumbar vertebrae, sacralization of the sixth lumbar vertebra, signs of spondylosis, and Schmorl´s nodes. The skull of the individual was significantly different from morphoscopical and even metrical point of view. Unusual ratio of splanchnocranium and neurocranium, strikingly prominent and wide zygomatic bones, very significant prognatism, and enlarged foramen magnum were observed, possibly indicating foreign origin of the man. Given the historical period, the probability of the man being an outlander is rather high.

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Session 15

Historical anthropology

Anthropological analysis of skeletal remains found in a circular object (middle bronze age) from Nymburk (Czech Republic)

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Skeletal material was obtained during the rescue archaeological excavation (the city ring road), which took place in 2009 in Nymburk. At the site were found 10 graves: 8graves were dated back to the Middle Bronze Age and 2 to the Hallstatt period (Bylany culture). This analysis focuses only on the funerals in a circular object,which was dated to the Middle Bronze Age. In the circular object were found seven graves (one with two individuals in one grave) a total of seven human individuals in six graves (one grave contained only animal bone).

The material was unearthed by author. Preservation of human bones varied, but generally increased with the depth of deposit. During the processing of the material were used standard morphometric and morphoscopic methods. Determination of sex showed 3 females, 2 males and 2 not identified individuals (according to DNA analysis more males). Age at death of 7 individuals covered the range from 12 to 50 years (12–14, 14–16, 16–18, 17–20, 30–40, 35–40, 30–50 years). Stature was estimated in one adult male (a very high stature) and one adolescent female (very high stature). In 2 adults stature was not determinable and the remaining three individuals were immature. From the anatomical varieties there was an interesting finding of sacralised first coccygeal vertebra of an adult male (object 359). On the left clavicle of the same individual was found the costoclavicular fossa, which is related to excessive load of costoclavicular ligament. No significant pathological changes were recorded. There were just fine and medium dental calculus on the labial surface of upper and lower incisors (in 5 individuals) and Schmorl's nodes on the bottom of the terminal area of Th 4–Th 7 (spondylosis deformans) on the skeleton of the adult male (object 359). There were no human bones in the grave in object 379, only a fragment of os coxae of larger animal.

Extraordinary Great-Moravian Graves from Staré Město in the View of an Anthropologist A Preliminary Report

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In spring and summer 2018, during a rescue archaeological research taking place in one of the gardens of Staré Město by Uherské Hradiště, the excavators came across very interesting and strange situation: almost none of 23 Great-Moravian graves that were detected here contained standard burial situation. While standard burial rite in Great-Moravian society means the deceased in outstretched position on his back in west-east orientation, here we found skeletons with heads almost to the north or south or in complete opposite orientation, in crouched or side position or, at least, with unusual positions of upper or lower limbs. One of the graves was probably a cenotaph. There is one double burial and a triple burial, too. Additionally, one of the graves, probably the oldest one, is completely different – this dead, presumably a member of a higher social class, was buried in a wooden coffin.

The locality is situated on the northern border of the well-known burial ground "Na Valách", where more than 2000 graves have been uncovered in the past. The main question is – who were these people? Why were they buried in such a special way? Unfortunately, the state of preservation of all the skeletons was very poor. An anthropological analysis identified skeletal remains of nine men, five women and six children, at the age range from three to eighty years. Only for three men we were able to calculate the stature, one of them was significantly taller than normal in men of his time. Most of the adult individuals were quite robust, with workload signs on their bones. Dental caries and intravital tooth losses were very common, perimortal injuries and degenerative changes of bones and joints were also observed. But there aren't any common signs which could help us to interpret what was going on here. In the future, we would like to subject these skeletal remains to further investigation, such as aDNA, Strontium isotope analysis or dental microwear, to determine origin, possible relationship and food strategies of these people and to understand this situation better.

Life at Early Bronze Age site of Nižná Myšľa (preliminary osteoarchaeological results)

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Nižná Myšľa, an Early Bronze Age site comprising of a fortified settlement, its agricultural surroundings and a cemetery with almost 800 graves, is believed to be one of the most important Early Bronze Age centres in the region. However, no complex anthropological evaluation was carried out until present. This study provides first results based on osteological evaluation of 94 well-preserved individuals from 310 graves dated to the first phase of the site's occupation. As a part of a pilot project, 45 adults (22 females, 23 males) and 49 subadults have been examined. The age at death was not higher than 50, and that the population was rather tall (males about 172 cm, females being about 10 cm shorter). Non-specific stress indicators such as cribra orbitalia and dental hypoplasia were present in 40 and 50% of the population, suggesting increased non-specific stress during childhood. As evidenced by the lack of traumas, osteoarthritic changes in temporo-mandibular joint, elbows and wrists, and by occupational dental wear, women were probably engaged in activities within the settlement, possibly including manual works such as pottery-making or sewing. In comparison, men are suggested to have lead a more demanding and dangerous lifestyle, suggested by higher frequency and severity of (multiple) traumas and higher rates and distribution patterns of degenerative joint diseases such as OA (mostly seen in spine and shoulder joint). A relatively large concentration of male graves equipped with boar tusks and arrowheads in the south-western part of the necropolis,

believed to represent graves of fighters, hunters, or generally important individuals, together with the fact that these men were all taller than 170 cm, could imply kin ties and that „craft" and/or status may have been inherited. Only two out of thirteen individuals with measurable skulls were mesocephalic (others were dolichocephalic), and both these individuals were buried in a separate group of graves at the edge of the cemetery. This may be an indication of different groups living in Nižná Myšľa. Society at Nižná Myšľa appears to have been horizontally and vertically stratified. The present work is, however, only a primary inspection of the lives of the inhabitants of Nižná Myšľa, and a more extensive anthropological research is necessary in order to reveal what the life at this important urban centre may have been.

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Stature estimation on northern Greek populations of Roman time

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Body height is one of the key concepts in the fields of physical and forensic anthropology, as well as in bioarchaeology. Its contribution is twofold: it is one of the five basic biological characteristics of an individual (sex, age, ancestry, stature, body mass), and it can also offer important insights in the study of human growth, living conditions and past societies. If all parts of a skeleton contributing to stature are preserved sufficiently, body height can be reconstructed accurately ('anatomical method' / 'Fully method'). Due to the frequent lack of such well-preserved materials, most stature estimations are performed by the application of regression formulas to the long bone lengths. However, there is an important relationship between the reference samples for establishing the regression formula and the target population, wherefore there is a need for population specific equations. Up to now, there is no regression estimation of stature specific for ancient Greek populations. In our study of northern Greek populations from Roman times (146 BC – 6th c. AD) we have collected 121 individuals (64 males, 57 females) where a stature reconstruction by the anatomical method was possible. Our reference sample consists of individuals from a rural population from the Kitrini Limni area and an urban population from Thessaloniki, both showing no relevant differences in their long bone lengths. Their mean reconstructed stature is 168.0 cm (±6.0) for males and 156.5 cm (±5.3) for females. They served as reference sample for new, population specific regression formula (OLS regression). Their potential is demonstrated by their application to different test samples. Additionally, we applied the traditional, most widely used mathematical methods to these populations. Our presentation will give an overview over the results and comparisons.

Demographic analysis of civilization of south-eastern urnfields in Slovakia

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The contribution deals with the issues of demography based on anthropological evaluation of the contents of the burial graves of the civilization period of the Urnfields in Slovakia. The civilization of people belonging to the Urnfield complex in Europe represents more or less unified cultural and historical whole. Based on anthropological analysis of osteological material from large explored burial grounds of this complex and archaeological-anthropological cooperation the demographic structure and age composition of the studied population was evaluated here, including the calculated life expectancy. Although human remains from cremation graves do not have as valid a meaningful value as osteological material, bring interesting demographic knowledge to a better understanding of prehistoric society in the period of the Urnfield civilization throughout Central Europe.

Burials from the Merovingian aristocracy from Gotha – Boilstädt

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During a rescue excavation in Gotha-Boilstädt (Central Germany), a Merovingian burial ground from the 6th and 7th century CE was found. Two graves stood out because of their extraordinary positions and grave goods. Close to both graves, ritual burials of decapitated horses were found, which is commonly seen in connection with Thuringian noblemen from the early medieval period. Both graves contained the skeletal remains of late adult males with strong muscle attachment marks. Characteristic skeletal features associated with horseback riding are present, which corresponds well to the horse burials close by. The individuals were buried with military equipment, such as spurs, lances, short and long swords (sax and spatha) and shields. Also, the other grave goods were valuable. In contrast to the mainly rather pagan equipment, one of the graves contained a bronze lamp of Byzantine provenience, with a cross-shaped handle and dove decoration, which indicate a Christian background. The paleopathological investigation gave an insight into the living conditions of the Merovingian nobility.

One individual from this burial ground, a female with an age-at-death of 40-50 years, showed an unusual case of dysmelia of the right arm. Her grave was robbed in antiquity, but at least some grave goods were still preserved. The shoulder and upper arm were shortened and displayed weak muscle attachment marks and a lower robustness compared to the left side. The main difference, however, was observed in the bones of the lower arm. The ulna was highly shortened and distorted; the radius was deformed almost beyond recognition. Unfortunately, no hand bones were preserved, but it seems likely, that the hand was also highly deformed, judging from the morphology of the wrist joint facet of the radius. Probably, the weak muscle attachment marks of the upper arm and shoulder resulted from inactivity atrophy due to the deformation of the lower arm (and possibly hand). Therefore, a diagnosis of erb-duchenne palsy (obstetric brachial plexus palsy) does not seem

plausible. As the deformity was most pronounced in the hand and wrist, poliomyelitis was not the presumable reason, but it cannot be excluded as a differential diagnosis. The most plausible differential diagnosis, however, seems to be Madelung's deformity, a congenital malformation of the wrist, occurring in about 1–3% of all hand and wrist deformities. The differential diagnoses will be discussed.

Evidence of interpersonal violence in the Early Bronze Age cemetery of Ludanice – Mýtna Nová Ves

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The Early Bronze Age cemetery of Ludanice – Mýtna Nová Ves is situated in the Nitra Valley, in Central Slovakia. Wooden grave chambers and grave goods, such as jewellery or bronze weapons, indicate the presence of an elite. The investigation of juvenile and adult individuals from the Únětice culture phase (1850-1730 BCE) of the cemetery revealed a high number of injuries. Especially blunt force skull traumas were often diagnosed. Among the 84 sufficiently well-preserved skulls, 17 (20.2%) bore injuries caused by blunt weapons, for example, hammer axes or clubs. In most cases, these injuries were lethal, but two were obviously survived and had healed. Furthermore, three arrow wounds were identified. In one case, the flint arrowhead was still stuck in the arch of a thoracic vertebra of a mature male. A

sharp force trauma was only detected once. The tibia of an adult male had been chopped half through by a large blade. Both sexes were robustly built. Traces of ligamentopathias, dislocated joints, as well as degenerative changes of the spine already at a young age, were frequently observed, indicating a high physical strain. Among the antemortal injuries, fractures of the forearm were often diagnosed, mostly in the mid-shaft region of the ulna ("parry fracture"). Furthermore, many cases of broken ribs in different stages of healing, fractures of the nose, the mandible, the scapula, the tibia, and the phalanges of fingers and toes, were observed. Traumas were mostly diagnosed in males, nevertheless, about one quarter of the individuals demonstrating skull injuries were females. Probably, the injuries were rather caused during raids against the victim's settlement, than on battlefields far away. The location of the site at the edge of the Únětice culture range might suggest a border situation. The rich graves and weaponry, as well as the observed vestiges of constant physical strain and characteristic patterns of healed injuries, point to the presence of trained warriors.

Abstracts – Posters – IACAH

Session 5

Poster discussion 1st part (posters No. 1–7)

P1 – Skull surgery in ancient Greece: New cases of trepanation from Classical-Hellenistic times

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Trepanation or trephination, the oldest surgical operation identified in archaeological context, is the surgical perforation of the human skull by drilling or removing a piece of bone. It is well documented all over the world and its antiquity dates back to the Mesolithic. In Greece, trephined skulls are dated since the Middle Minoan period. Despite the detailed textual description of trepanation in the Hippocratic Corpus, there weren't skeletal findings to verify its implementation in classical times in Greece. We report four skulls from the Classical-Hellenistic period, excavated at the necropolis of ancient Akanthos, on the Athos peninsula, North Greece. The aim of the study was to analyse the techniques used and the motives behind the operation. We used macroscopic and stereoscopic observations as well as CT scanning to investigate traces of surgical tools, associated pathology and survival. In the skeletal sample from Akanthos, two different trepanation methods identified, scraping and drilling. We also reviewed the already published cases from Greece in order to understand other aspects of the operation, regarding demographic parameters, side and location of the lesions and survival rates.

P2 – Breastfeeding and weaning patterns in ancient Thessaloniki

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Breastfeeding and weaning are perhaps the most important biological processes for the physical and mental development of man. By acting as catalysts, they have a significant impact on the shaping of social roles while at the same time their practices are modified on the basis of perceptions, religious beliefs and socio-economic conditions. At the same time, they play an important role on the demographic aspects of a population, affecting its fertility, morbidity and mortality. It is therefore paradoxical that while breast feeding is probably one of the most important processes for the physical and mental development of humans, it has not been adequately studied in prehistoric and historical populations.

Novel applications of paleodiet reconstruction allow nowadays the study of breast feeding and weaning as part of past human activity. Our project studies breast feeding and weaning patterns

in ancient Thessaloniki by applying the novel technique of incremental dentine analysis. We aim to account on the duration of breast feeding and weaning and report on possible diachronic changes especially through the change to Christianity. This method tracks the isotopic swifts of carbon (δ13C) and nitrogen (δ15N) on the sequential layers of dentine for every year of age since birth. Dentine, in contrast to bone does not remodel and is developed following a standard pattern. This characteristic enables researchers to study infant diet with great precision. Ultimately, we will be able to delve deeper into the biological effects of breast feeding for mothers and children as well as describe cultural and social differences as seen on burial context, parental investment and the transition to adulthood from the Roman to the Byzantine Period in Thessaloniki.

P3 – Aleš Hrdlička and American archaeologists and anthropologists in Moravia between the two world wars

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The poster traces the work of American archaeologists and anthropologists at Moravian sites in Czechoslovakia between the two world wars. At the forefront of American anthropological and archaeological research in the country in this period was the Czech-born American Aleš Hrdlička, whose influence was also manifested in contacts with Karel Absolon in Brno. Participants from the American School of Prehistoric Research were also interested in Moravian Palaeolithic sites, and many original finds found their way into various collections in the USA from Moravian archaeological sites thanks to the activities of this institution.

P4 – Ancient DNA mining from chemically treated and non-treated human dental calculus

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During the last century, scientists commonly underwent a procedure of preserving osteological material via chemical conservation. It was a standard routine, which continues to this day, especially when very rare finds, which are deposited in museums, are concerned. However, scientists assumed that chemical conservation, which is supposed to protect the human remains from degradation, would actually prevent the aDNA from extraction and further analysis. Especially nowadays, when molecular methods are available and widely used in this research field. As a result of this procedure, many human remains are untouched by genetic analysis.

This study focuses on the samples treated by chemical conservation, namely dental calculus of individuals from two burial sites dated back to the Great Moravian Empire (9th – 10th century AD). The first site Pohansko – Kostel, was excavated in the 1960s. The human remains have been treated by celluloid dissolved in amyl acetate and acetate solution. 409 graves were excavated, from which the individuals were selected based on the size and location of their dental calculus for purposes of our

research. The other site is located in Znojmo – Hradiště. The excavation is recent and ongoing since 2007. These remains were never chemically treated, thus serving as a comparison for the isolation protocol and further analysis. The samples were selected based on the same parameters as those, which were applied to the samples from Pohansko – Kostel. The aDNA of dental calculus was isolated from both graveyards with MinEluteTM PCR purification Kit (Qiagen). The results were analysed thoroughly in order to clarify whether the conservation treatment enables further scientific research of such samples.

P5 – Diet reconstruction in High Middle Ages to Early Modern Period Population

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Diet reconstruction plays important role in understanding past populations. In this study, analyses of carbon (δ13C) and nitrogen (δ15N) stable isotope ratios were carried out in 20 adult individuals from High medieval to Early modern period population excavated at cemetery of St. Peter and Paul Church in Horažďovice. For dietary background data, 15 animal samples from the same archaeological context have been analysed until now. Stable isotope ratios of both human and animal samples were measured in bone collagen to obtain information about dietary protein. Collagen extraction procedure followed the method of Longin (1971) with modification from Bocherens (1992).

Differences in diet based on sex and age were examined. There was no statistically significant difference in δ13C and δ15N values between age groups. The δ13C values were also not statistically different between men and women. However, significantly ($p=0.046$) higher δ15N values were found among women (12.46 ‰, SD = 0.42), than men (11.61 ‰, SD = 1.10). Also the variability among women sample was smaller ($p = 0.01$), than among men sample.

This study was supported by the Grant Agency of Charles University with grant no. 624217 and Ministry of Culture of the Czech Republic (Grant number: DKRVO 2019-2023/7.I.a, 00023272).

P6 – Craniofacial identification of high church hierarch buried in the Transfiguration Cathedral in Tver

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In 2013–2014 archeology excavations were conducted in the centre of the modern town of Tver (European Russia) on the Transfiguration Cathedral area. The Cathedral was the oldest white-stone cathedral in the city and the burial place of the highest church hierarchs. It was destroyed in 1935. The remnants of the Modern Age necropolis were discovered. Only one burial with completely preserved

bone remains was almost not disturbed. This made it possible to conduct an anthropological study. Remains of rich decorated church vestments indicate that the deceased belonged to the highest spiritual rank. The burial was dated ranging from the last quarter of the 19th century to the beginning of the 20th century. The main purpose of our study was the identification of the Archbishop, buried in the cathedral. The identification of the person by the skull was carried out using three identification methods. Creating the verbal portrait of the face from the skull, creating cranio-facial reconstruction, conducting of cranio-photo superposition the skull contours with the portraits of people who were buried in the cathedral. An anthropological description of the face was created using the method «craniofacial correspondence» This is an algorithm for creating a descriptive portrait of a living face using the dimensions and characteristics of the skull. This helps to identify the most likely person and eliminate those that are not valid, in the first stage. The cranio-facial reconstruction was created, according to the standard method. After the facial reconstruction was completed, lifetime photos of four archbishops buried in the necropolis were obtained. They were Alexiy Rzhanitsyn, Eusebius Ilyinsky, Savva Tikhomirov, Anthony Korzhavin. For the purpose of identify the burial, a photo-superimposition was applied. Using the method of photo superimposition and descriptive portrait it was possible to completely exclude the belonging of the skull to Archimandrite Anthony and Eusebius. A more difficult situation with Archimandrite Savva and Alexius. We did not succeed in completely excluding the possibility that the skull belonged to Archimandrite Alexy. But most likely it belongs to Savva. The facial reconstruction was taken before all studies and before the submission of the photographs. It is most similar to the portrait of Savva. Thus, using three independent identification methods we can get the most accurate conclusions.

P7 – A "perforated" human hyoid bone: bone artefact or thyroglossal duct cyst?

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We report a case of a „perforated" human hyoid bone recovered in the 1920s by Josef Szombathy during excavations of the Early Bronze Age cemetery of Gemeinlebarn (Lower Austria). The object under discussion represents a well-preserved green-stained hyoid body that was encountered with ornaments (34 perforated carnivore canines and 67 trapezoidal perforated bone pendants) in the neck area of a young female. Based on the location within the grave and on the fact that the circular cavity in the centre of the hyoid bone bears a striking resemblance to the perforations in the ornaments, Szombathy identified this item as an archaeological artefact. It subsequently became part of the collection of the Department of Prehistory of the Natural History Museum in Vienna.

In the course of the HERA- and EU Horizon 2020-funded DEEP DEAD-project we rediscovered the object and re investigated the altered hyoid body by microscopic and µCT-inspection in order to clarify the nature of the perforation. Our investigation found that there is a complete a lack of artificial traces. The following characteristics suggest a very rare malignancy of the thyroglossal duct: size and shape of the cavity; a rounded (remodelled?) outer edge; a sharp and protruded internal edge of the cavity; as well as the fact that the defect is located in the centre of the hyoid body with signs of infection. Besides the object history, we will discuss the conditions that may have caused this rare defect, which until now has not been observed in prehistoric human remains.

Session 5

Poster discussion 1st part (posters No. 8–17)

P8 – Virtual Projection of 2D Basic Facial Features onto a 3D Model

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Employment of a projection of 2D imagery such as portraits or photographs onto a virtual 3D face model based on skull data is still sparingly used methods in the field of anthropological craniofacial re construction (CFR). However, this image-to-geometry projection is well known in the routine computer visualisation field in general. It is widely used for example in architecture, film making and other areas. Following that, we believe, that there is a great potency for the use in CFR even though on ly a skull and 2D imagery are available. We firstly validate this method for use in anthropology when dealing with historical portraits and their projection onto the virtual face reconstruction based on CT data of the dry skull of the 19th-century figure abbot Ferdinand Seka. This study concentrates the validation of this method utilising living person head CBCT scans. CT images allow for generating of 3D virtual (1) face models used to prepare a general 2D facial features map in the frontal, se mi-profile and profile view; and (2) skull models employed for simple manual computer-aided reconstruction of the facial soft tissue surface. Facial features map is projected from several perspectives onto the real 3D face model, and onto the manually reconstructed face model, too. Locations of projected facial features lines and points are compared regarding their concordance with the actual position of respective lines and points on the real face model. Contrary to physical limitations of this method, nevertheless, it is possible to project 2D facial features onto a basic 3D face reconstruction ba sed on the dry skull, and with accuracy identify the individual features on the surface allowing more accurate details approximation which would not be possible with the use of the skull itself.

P9 – Occurrence of scurvy in the Czech Lands at various historical periods

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Scurvy is a disease caused by lack of vitamin C (L-ascorbic acid) in the human body. It manifests itself by endochondral ossification damage, bleeding in the muscles, subcutaneous tissue and gums. The

presence of ossified subperiosteal hematomas and manifestations of anaemia on skeletons is typical. Fractures or defects on the bones of the cranial vault and the costochondral junctions may also be present.

Scurvy is considered to be a typical disease of sailors and is mainly associated with great overseas discoveries in the 15th and 16th centuries. Higher occurrence has also been reported inland in a periods of long-term famine accompanying natural disasters and wars. Palaeopathological research provides direct evidence of the occurrence of this disease in the Czech Lands (Central Europe), from prehistory to modern times.

The oldest case of scurvy from Podivín is dated to the Old Eneolithic (3800 to 3650 BC). The finding from the vanished village of Trutmanice near Velké Pavlovice comes from 13th – 16th centuries. Signs of scurvy on skeletons belonging to modern time were discovered in the former town cemetery on Malá Nová Street in Brno (turn of the 18th–19th centuries). We assume that the occurrence of scurvy in the past is higher than can be demonstrated by palaeopathological studies.

P10 – Residential mobility in Great Moravia investigated using strontium isotope analysis

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Strontium isotope analysis has become a valuable tool in studies concerning past populations, allowing us to identify individuals of non-local origin even in cases where other markers are not available. In our poster we present preliminary results of such analysis assessing residential mobility of population buried on early medieval site of Mikulčice-Valy. The main objectives of this study were a) to create a strontium baseline for this and further migration studies concerning the southern Moravia region and b) to provide an insight into population mobility in Great Moravia, with particular interest in elite women. Local 87Sr/86Sr range of bioavailable strontium has been established from 26 samples of historical fauna excavated on this site as well as from 10 human bones buried in the hinterland of Mikulčice. Human tooth enamel has been sampled from 100 individuals, showing no statistically significant differences in 87Sr/86Sr ratios between elite/non-elite men/women, mostly corresponding with local baseline. However, 9 individuals exhibit strontium values outside of the expected range, marking them as migrants. These cases consist of both males and females of various social status with no visible links between them. Therefore, we conclude that residential migration was present in Great Moravia to some extent, and it was most likely not restricted to a certain sex or socioeconomic status group. This study was supported by the Grant Agency of the Charles University in Prague [grant number 1076218] and by the Ministry of Culture of the Czech Republic [grant number DKRVO 2019-2023/7.I.a, 00023272].

P11 – Turner-syndrome patients' body structural characteristics

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Turner-syndrome is characterized by the absence of the entire or the part of second X sex chromosome. The presence of the X chromosome is necessary for the development of ovaries, which produce estrogen. Estrogen plays an important part in the development of bone mineral content and the formation of peak bone mass. Different treatment schemes are known to mitigate the symptoms and compensate the deficiencies in Turner syndrome. The main aim of the presentation to introduce the results of a body structural study of Turner-syndrome patients by highlighting the most important relationships between body structure, karyotype and treatment type in the syndrome.

Twenty girls and women with Turner-syndrome, who received or not received hormone replacements, were studied. Bone mass was estimated by the Drinkwater-Ross four component model. Muscle mass, fat mass and visceral fat area were estimated by bioelectrical impedance analysis (InBody 720 device). Bone structure was measured by ultrasound DTU-One osteometer. Bone mineral density was measured by XCT 2000 peripheral Quantitative Computed Tomography. The pattern of body and bone structure parameters was analyzed by cluster analysis.

The Turner patients' body structure was very inhomogeneous. Based on the results of the cluster analysis of bone and body structural parameters, we could separate the subgroups of the syndrome, bone density and the relative length of the limb segments were the most important separators. The subgroups were: subgroup A – a group of patients who have 45,X0 karyotypes and received or are receiving hormone replacement; subgroup B: patients with 46,XX/45,X0 mosaic karyotypes; subgroup C – patients with isochromosomes (and subgroup D – patients who could not be classified into the other three groups). The length measures and the bone density of the group with isochromosomes differed significantly from the other groups' values. While the width, girth, skinfold thickness, body mass components, bone structural parameters of the subgroup with 45,X0/46,XX mosaic karyotype were also different than in the other subgroups.

Regular body and bone structural examinations are of high importance, but the genetic subgroup is also very important in the health care of Turner-syndrome patients.

P12 – Changes in physical development and motor fitness of students studying at the University of Zielona Góra (1990-2015)

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The paper aims to present the trends and sizes of intergenerational changes in height and body mass as well as selected motor features of students studying at the University of Zielona Góra.

The material consists of the measurements of somatic (height and weight) and motor (agility, arm strength, lower limb explosive strength and endurance) features of 459 female students and 218 male students starting the University of Zielona Góra in the years 1990-2015. The collected material was developed statistically. The significance of differences between the series of tests was calculated with Student's t-test.

A significant increase in men's body height by 3.27 cm (on average 1.31 cm per decade) and in women's body heighr by 1.73 cm (on average 0.55 cm per decade) was observed over the period of 25 years, The body mass of male students increased on average by 5.48 kg (on average 2.19 kg per decade), while in female students by 2.41 kg (on average 1.84 kg per decade), with statistically significant differences. In the analysed period (1990–2015), a growing trend of the weight-height ratio was found in both female and male students, with a statistically significant difference only among females. In relation to motor features of the university students the regression of the arm strength, agility, explosive strength of lower limbs and endurance was observed with statistically significant differences.

Changes in height and body mass that occured in university students from Zielona Góra in the years 1990–2015 show that the secular trend is persistent. Increased average values of the weight-height index in the males and females inform about the progress of body corpulence. In the tested students an unfavourable direction of change in arm strength (determined by the distance of the medicine ball throw), agility (determined by the time of the envelope run), the lower limb explosive strength (determined by the long jump distance) and high speed endurance (determined by the number of squat thrusts) was noticed.

P13 – The secular trend in the height and weight of boys and girls residing in Lubusz Region (2002-2017)

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The study aimed at presenting the directions of changes in the physical development of the children and adolescent population of Lubuskie Voivodeship.

The material was collected in 2015–2017 among 3,996 students (1858 boys and 2138 girls) aged 7–18 living in the rural areas of Lubuskie Voivodeship. The weight-height index (Rohrer's index) was calculated based on the measurements of their body height and weight. The material was developed statistically. The results were compared to the 2002–2003 study.

Having analysed the data collected within 15 years (2002–2017), a significant increase in the average body height of boys aged 10–14 and girls aged 13 and 15 residing in the rural regions of Lubuskie Voivodeship has been observed. Changes in body height that occured in the population of students aged 7–18 in the years 2002–2017 indicate a slowdown in the secular trend. The deceleration of body height was found in boys aged 7, 9 and 18, and in girls aged 8, 10 and 17. Over 15 years, in all age

groups of girls there was a significant increase in body weight (except 8–9-year-olds and 18-year-olds), whereas in boys it was observed in the groups aged 8 and 11–18.

Secular changes in the weight-height proportions of the examined population of students aged 7–18 show a significant increase in the body size of boys aged 9 and 11–18 and girls aged 8–10, 12–13, 16–17.

In 2002 and 2017 the pubertal growth spurt occured in girls aged 11–12, and in boys aged 12–13 and it was characterized by lower values in 2017.

P14 – Comparative characteristics of biological indicators of students from different countries of the world

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The groups of first year students of BSMU from different countries of the world (Belarus, Iran, Lebanon, Turkmenistan, India) were examined and the biological indicators have shown both gender and ethnic characteristics.

The obtained data of biological indicators show the presence of adaptive rearrangements in the organisms of the students who found themselves in new climate-geographical and socio-economic conditions.

P15 – Quantitative ultrasound densitometrical and body structural parameters in screening of bone structural abnormalities in women

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Numerous studies have confirmed the obvious relationship between bone mineral density and endocrine status. Peak bone mass is reached in the third decade of life and sustained until the fifth decade when the age-related bone loss begins. Beside the age-related bone loss there is an accelerated bone resorption in women within 5 to 10 years after menopause related to estrogen deficiency. Dual-energy X-ray absorptiometry and ultrasound densitometry are widely used to screen osteoporosis and other bone structural diseases. BIA devices can also estimate bone mineral content (BMC) but it has not been recommended for diagnostic purposes. The main aim of the present study was to analyse how estimates of body composition and bone mineral content can predict bone structure in women.

Healthy premenopausal women (n: 130, 18-45 years) and postmenopausal women (n: 130, 46-75 years) were enrolled to the present analysis. Estrogen level was estimated from saliva samples.

Menopause was defined as amenorrhea of 12 months duration and was confirmed by measurements of salivary 17-β-estradiol concentrations <4 pg/ml. BMC (kg) was estimated by In Body 720 analyser. Bone structure was measured by ultrasound osteometer (DTU-One Osteometer). Broadband ultrasound attenuation (BUA, dB/MHz), which estimates the structural characteristics of trabecular bone, e.g. porosity, was used to assess bone structure in the analysis. Body mass components, bone and muscle mass (kg), were estimated by Drinkwater-Ross anthropometric method.

The age changes of 17-β-salivary estradiol concentrations, BMC, relative bone mass, relative muscle ma ss and bone structural parameters were analysed in premenopausal and postmenopausal women. BMC ($r=0.43$, $p<0.01$), relative muscle mass ($r=0.44$, $p<0.01$) and relative bone mass ($r=0.38$, $p<0.01$) were strongly correlated (Pearson correlation) with BUA in premenopausal women. In postmenopausal women weaker relationship was identified between BUA and its hypothetical predictive factors.

BMC and the other studied body mass components alone do not provide enough information to identify osteoporosis, but can complete and widen the screening methods for bone structural diseases. The bone mineral density of healthy premenopausal women with low BMC, low bone mass and/or low muscle mass values should be measured.

P16 – The influence of training on the physical characteristics of adolescent swimmers and hockey players

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The aim of the study was to evaluate the mobility of the backbone, the condition of the foot and the fundamental anthropological characteristics in adolescent swimmers and hockey players. 36 swimmers (boys aged 15–18 y.) and 40 hockey players (boys aged 14–18 y.) participated in the research. Body weight and height, selected circumferences and skinfolds were measured. The hockey players had statistically higher values in their somatic characteristics, such as BMI and skinfolds above triceps, subscapular and suprailiac. The tests that evaluate backbone mobility (Stibor's test, Otto's test, Schober's test, Cepoj's test, the test of lateral flexion and modified Thomayer's test) were performed. Chippaux-Smirak index was calculated from the footprints. The results show that the adolescent swimmers achieved better results in backbone mobility and condition of the foot than the adolescent hockey players.

P17 – Tests of motoric performance and physical fitness in Czech professional and voluntary firefighters

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The aim of the study was to compare physical proportions, body composition and motoric performance of professional and voluntary firefighters aged 25 to 35 years. Professional firefighters were chosen because they are considered the most physically fit among the adult population. Moreover, the motoric performance of professional firefighters is regularly controlled, and decline in fitness is a reason for termination of employment. Since voluntary firefighters assist professionals in emergencies, they tend to be under the same physical and mental stress. The fundamental somatic characteristics (body height and body weight), circumferences and skinfolds were performed. Using the Bodystat®1500MDD, the body composition (body fat and active body mass) of the investigated subjects was detected. This study used the Ruffier test and hand dynamometry as well. The results show that the data of professional and voluntary firefighters do not vary considerably.

Session 12

Poster discussion 2nd part (posters No. 18–23)

P18 – Age variation of cephalic index according to schoolchildren transverse and longitudinal studies data

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The variability with age of various forms of the head was ana-lysed from longitudinal and transverse studies. The basis for the study was data on the head shape of schoolchildren from town of Miory, Vitebsk Region, aged 6–17 (transverse study in 2002-2003, 1179 children) and schoolchildren from Minsk, aged 7–17 (longitudinal study of the 1980th, 912 children).

From 7 to 17 years, both in boys and girls, the mean values of the head index increased by more than 1.6 units. With age, the proportion of dolichocephalic and sub-dolichocephalic morpho-types decreases, and the proportion of brachycephalans increases ($p < 0.05$). Among the children of Minsk, there are significantly more dolichocephalic and sub-dolichocephalic morpho-types compared to their peers from the city of Miory, Vitebsk region. At the same time, brachycephalic forms have an advantage among the children of Miory.

P19 – Monitoring of body composition in boys aged 12–15 and girls with obesity during a weight reduction stay in Lázně Teplice nad Bečvou, a.s.

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The incidence of obesity in childhood is increasing rapidly and is one of the most widespread non-infectious diseases in the Czech Republic and worldwide. The consequences of obesity cause a number of health complications (metabolic changes, disorders of circulatory and supportive musculoskeletal systems, mental and emotional disorders, etc.). An important role in the treatment of obese children is played by specialist treatment facilities in close cooperation with paediatric practitioners and parents.

The objective of the research is to verify the effectiveness of the treatment procedure during the therapeutic stay of children with obesity aged 12–15 in the spa facility in Teplice nad Bečvou.

The monitored group consists of 107 research participants (56 boys and 41 girls) aged 12–15, who started a 4-week stay. The research participants were measured at the start and at the end of their treatment stay. For each research participant, nutritional status was measured at entry and exit and evaluated using standardized anthropometry methods: body height, weight, waist circumference, hips and arms. BMI, WHR, WHtR and Conicity index (CI) were calculated based on the measured parameters. Body composition diagnostics was performed using a bioimpedance analysis (BIA) by the InBody 230 device. Based on the analysis the following parameters were monitored: kg and percentage of fat, fat-free body mass, and visceral fat.

The results showed that there was a significant reduction in weight, waist and hip circumference, kg and percentage of fat and visceral fat between the entry and exit measurements of research participants during the 4-week weight reduction period. There was no statistically significant difference in muscle and total fat-free body mass.

Based on the analysis of these results, the effectiveness was confirmed of the weight reduction stay in the observed group of research participant in terms of weight reduction.

Project: The effectiveness of treatment procedure during the curative stay of children with excessive weight and obesity aged 12–15 years in spa facilities (IGA_FZV_2019_004)".

P20 – Sleep quality and sleep patterns in men and women in relation to body composition

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Incorrect sleep regime and sleep deprivation in today's modern society is associated with the risk of numerous health problems, including weight gain in healthy people and the subsequent risk of obesity and other metabolic diseases (metabolic syndrome, type 2 diabetes).

B height, weight and body composition were measured by standardized anthropometry in a group of 500 research participants (55 men, 445 women) using the bioelectric impedance method. The research participants also agreed to complete the standardized Quality of Life questionnaire (WHO questionnaire, WHOQOL-Bref), which examines satisfaction with and quality of sleep.

The distribution of research participants in categories by BMI showed that 6.20% of research participants were underweight, 69.20% had normal weight, 17.60% were overweight and 7% were classified in the obesity category. Overall, the probands stated that they were satisfied and unsatisfied with their sleep and rated the quality of their sleep as medium. The level of satisfaction and the quality of sleep were rated lowest by the probands from the obesity category.

Pr ojects: Somatic characteristics of women during their pregnancy and their lifestyle (IGA_FZV_2016_007). The second phase of the longitudinal tracking of somatic characteristics of women during pregnancy, their life styles (IGA_FZV_2017_010).

P21 – The influence of nourishment on the somatic growth of children from birth to one year of life (The longitudinal study)

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The aim of this study was to examine the group of children, to compare results with the standard, and to evaluate influence of breast feeding on the somatic growth of this children's group.

The authors present results of the longitudinal observation of 216 children (111 boys and 105 girls) born in Martin. We examined the children regularly in three-month intervals from the birth, till the twelfth month of their life, using the Martin-Sallers methodology. The examination included reading of body weight, body length, chest and abdominal circumference, arm, thigh and calf circumference, head circumference, maximum length and width of the head. We also calculated BMI, cephalic index, Rohrer's' index and the arm circumference related to the head circumference index. Upper-arm-head circumference index is important as it provides necessary information on the growth and development of the youngest individuals. Obtained measurements were compared with the expected values of the healthy population (Neščáková, Drobná, 2000), using the standard scores (z-scores). T-test was used in statistical analysis. The groups of children were separated in subgroups according to the duration of breast feeding. In monitoring subgroups 80,56% children till 3 months were breast fed, 62,50% children till 6 months were breast fed, 48,61% till 9 months were breast fed and 43,52% children till 12 months were breast fed. Mothers in our subgroups of children breast fed their babies most frequently till the 12th month regardless of family state or number of children and attained education level.

The results show that children in our group have lower body weight and they are smaller than the healthy population. Boys have higher body weight and they are taller than girls, but the thigh circumference was bigger in the girls.

P22 – Examination of population differences in radio-ulnar gradients on pilot samples of the Slovak and Czech population

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Several dermatoglyphic studies focus on Czech and Slovak population but there are not many that focus on radio-ulnar gradient among them. In recent studies radio-ulnar gradient of several hand characteristics shows promising results as being environmentally sensitive and thus potentially effective for evaluation of population differences.

In this pilot study we collected and analysed dermatoglyphics of 60 Czechs (30 females and 30 males) and 60 Slovaks (30 females and 30 males) aged from 15 to 83 years (Czechs from 15 to 53 years and Slovaks from 16 to 83 years). We reported a wide range of dermatoglyphic variables including total

finger ridge count (TFRC), a-b ridge count (a-b RC), atd-angle and frequencies of fingerprint patterns with direct focus on radio-ulnar tendencies especially in finger ridge-count (RC) and frequencies of fingerprint patterns. This pilot study is comprehensive dermatoglyphic research assessing similarities and differences between Czech and Slovak population especially in terms of radio-ulnar gradient.

P23 – The study of color preferences of belarusian students

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Features of color perception are formed in the process of individual development, and the preference of color changes with age. Results of psychological examinations of school students of Minsk (boys and girls of 8, 13 and 17 years, total 590 people) with application of the eight-color test of M. Lyusher are analysed. Age dynamics of a number of the parameters evaluated according to test which reflect psychological characteristics at males and females is tracked. On the majority of indicators (vegetative balance, working capacity, a total deviation from autogenic norm and others) school students of Minsk found level close to optimum. Group of males of 17 years which indicators testify about the need for tranquility and stability are distinguished from the sex-and-age groups examined.

Session 12

Poster discussion 2nd part (posters No. 24–31)

P24 – Somatic profil in young aged children

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P25 – Relation between BMI and morphological parameters of foot in young school-age children

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The main aim is to evaluate the effect of BMI on selected foot morphological parameters in children of younger school age.

1 000 boys and 1 076 girls were measured under standard measurement conditions, following ethical principles, after signing informed consent by legal representatives and after approval by the Ethics Committee of FTK UP in Olomouc. Podograph (Capron Podologie, France) was used to take footprints. Selected foot parameters were foot length, width of the front part of the leg, heel length, heel width, height of the longitudinal arch of the foot and big toe misalignment. Statistical data processing was carried out by STATISTICA program. The Kruskal-Wallis test was used to determine the relationship between the foot morphology parameters and BMI categories. The relationship between BMI categories and longitudinal arch of the foot or toe misalignment categories was investigated through the Pearson chi-square test.

During the relation appraisal between BMI and these parameters the sex and laterality were concerned. From the point of view of BMI categories normal weight category was the most numerous one. The category combining children with overweight and obesity was represented more than the category combining children with underweight and low weight. In the big toe misalignment category, it was the valgosity that dominated the set and from the point of view of longitudinal foot arch appraisal the normal arched foot was represented the most. The high arched foot category was represented more frequently in the set than the flat foot category. Nearly every observed parameter showed statistically significant relation with BMI. The only parameter, where no statistically significant relation with BMI was proved, was the big toe misalignment.

P26 – Secular changes in body composition and fat distribution in Czech preschool children

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The effect of sedentary lifestyle has a negative impact on individuals from an early age. The lack of movement is reflected not only in the lack of motor development, but it also affects all aspects of child growth and development comprehensively. Under the influence of hypokinesia, there are secular changes in both body composition and fat distribution in boys and girls. The current results of a study of Czech preschool children reveal a new trend, a significant increase in body fat percentage at normal BMI. It is a so-called hidden obesity, or latent obesity, previously described in adult patients with high metabolic and cardiovascular risk as normal-weight obesity. The primary cause of this form of obesity is lack of exercise and improper diet causing insufficient development of active body mass, especially muscles, which are replaced by fat tissue. Thus, the ratio of the individual components of the body composition changes, but the weight proportionality is maintained. Another element in the trend of long-term changes is the apparent predominance of central fat distribution in current children. It concerns both the apparent and latent forms of obesity. This is obvious from the significant increase in abdomen, chest and cristal iliac skin folds in the study of children aged 4–6 years. Trunk fat distribution, which is a significant correlate of visceral fat, increases the risk of metabolic complications from pre-pubertal age.

P27 – Influence of a complex of socio-economic factors on physical development of teenagers of Belarus

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The influence of a complex of socio-economic factors (education and status of parents, living conditions and financial situation of the family, completeness of the family and number of children in the family) was studied to the physical development of adolescents in the capital of Belarus (multiple regression analysis was applied). In the analysis were included 28 signs characterizing the body's growth in length, width, development of the muscle and fat component of the body composition.

At the first stage the share of variability of anthropometrical indicators from combination of factors is defined. On separate anthropometrical signs it made 14,7–25,4% at boys, girls have 10,8–22,2%. The physical development of boys to a greater extent than of girls depends on socio-economic factors.

At the following stage environment factors the most significant for physical development of teenagers are defined. The greatest connection of physical development with the level of education of the mother and the material situation of the family was revealed. The higher the educational level of the mother and the financial situation of the family, the higher the indices of the physical development of adolescents.

Indicators of physical development of boys and girls discover different sensitivity to certain factors of the environment. The level of education of the mother more significant factor for boys, for them more signs which are reliably depending on the level of education of the mother, than for girls are defined. Financial situation of the family more significant factor for girls. Sons of mothers with the higher education are higher, have a developed chest, higher weight of a body, than contemporaries who have mothers with secondary education. And, the weight at them is higher at the expense of bigger development of skeletal muscles, at the lowest development of hypodermic fat. In families with low financial situation daughters are undersized, have a disharmonious ratio of length and weight of the body due to deficiency of weight, a poor development of muscular and fat components of structure of the body. Girls in such families have narrower pelvis and a small chest. Girls from families with high financial situation have the most developed chest, muscular weight, the greatest width of the pelvis.

P28 – Inter-population Variation in the Metacarpophalangeal Pattern Profiles

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Hitherto comparisons have shown that human zeugopodia (radius, tibia) are in their growth more sensitive to external environmental influences than stylopodia (humerus, femur). The question is whether the proximodistal gradient of sensitivity continues to tubular bones of autopodium. Using the metacarpophalangeal pattern profile analysis (MCPPPA) we studied inter-population differences in Polish population extracted from the Wrocław Growth Study (1961–1972) and compared the results with published data from a North Wales population (2001) and an US American standard (1972). The studied material consisted of 985 X-ray sheets of 103 left hands of boys and 47 left hands of girls in the age from 9 to 19 years. The metacarpophalangeal pattern profiles of the Polish sample were generally more similar to the profiles from the North Wales than to the American standard. The average lengths of all hand bones of both boys and girls were much smaller than the American standard averages except for the metacarpal bones. Moreover, each bone row expresses different inter-population differences and any simple proximodistal trend cannot be proven. We conclude that although the method was designed and used primarily for visual detection of congenital hand malformations it is also suitable for studying inter-population differences in general/healthy population.

P29 – Reference curves of selected circumferential parameters for Czech children aged 6 to 11 years

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The Czech Republic belonged between countries with tradition of extensive nation-wide anthropological surveys, which observed somatic status of children. But, this tradition has not continue in

this way. So, the regional anthropological surveys are justified. The aim of this study was to create age- and gender-specific reference curves for selected circumferential parameters in Czech children.

Data concerning children´s circumferential parameters (abdominal circumference, gluteal circumference, arm circumference, waist circumference) were collected via anthropometric measurements. The research sample consisted of 2093 children from 6 to 11 years-old (boys, n = 1008; girls, n = 1085). Only children with parental informed consent were included. Statistical analysis was performed using SPSS v. 22. The statistical analysis was performed separately by age and gender. Anthropometric data was summarized by mean and standard deviation. The percentile curves of circumferential parameters were calculated (P3, P10, P25, P50, P75, P90, P97) in R 3.4.2 software (R Foundation for Statistical Computing, Vienna, Austria) with the use of gamlss package.

The study developed age- and gender-specific percentile curves of selected circumferential parameters for Czech children aged 6 to 11. Girls and boys displayed a similar pattern of age-related changes in selected circumferential parameters. These parameters gradually increased during childhood. The purpose of this study is to serve as a reference to enrich the methods of evaluation of somatic status in Czech children and its comparison with studies worldwide.

P30 – Characteristics of elite youth soccer players by date of birth and biological maturity level

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Introduction: In a sport where strength, speed and power are a decisive attribute of success, are in youth categories given preference to players who show current higher performance due to early physical maturation, birth in the first half of the year or a combination of both compared to their later born peers. This leads to a systematic neglect of other elements of talent and the fact that physical deficiencies caused by later developing of the organism will be eliminated in adult categories.

Objective

To compare anthropometric characteristics of football players of the national teams of the Czech Republic participating in the U15 international tournaments.

Methods

For players participating in the under 15 national team tournament in Italy (U15, n = 19, players born in 2004, Torneo Delle Nazioni 2019) and players participating in the future under 15 national team tournament in Belgium (FU15, n = 18, born 2004, Tournament U15 Future), the basic characteristics were determined: body height, body weight, current level of biological maturation (APHV) and quarter in which the player was born. The basic characteristics were compared within groups.

Results

The average age of U15 players was 15 ± 0.2 years, body height 184 ± 6.3 cm, body weight 70.8 ± 7 kg and APHV 13.3 ± 0.5 years. The average age of FU15 players was 14.7 ± 0.2 years, body height 161.2 ± 9.8 cm, body weight 36.2 ± 6.5 kg and APHV 14.6 ± 0.6 years. Both body height, body weight and level of biological maturation as well as date of birth play an important role in the selection of players for the national team of the Czech Republic in the category under 15 years. The presence of a higher proportion of early matured players and players born in the first half of the year is information for the national system for identifying and developing talented football players.

P31 – Dynamic observation of physical development indices of schoolchildren in the Republic of Belarus

Marfina V.[1]

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We introduce the results of longstanding anthropometric observations over the growth and development of 7–17 year – schoolchildren in the Republic of Belarus (about 20 thousand of people examined in the years 1996–1997 and 2006–2007). As it is shown in the comparative analysis of anthropometrical data for 10 years (researches in 1996–1997 years and 2006–2007 years) in the age range of 7–8 years there are no substantial shifts of indices of body weight and chest circumference among boys, while body weight tend to increase.

Inter-ethnic comparative analyses of physical development and puberty in schoolchildren from Belarus, Russia, Poland, Serbia, Bulgaria and Estonia carried out in the late 1990s – early 2000s showed that the most similar trends in growth dynamics were observed in the children of Belarus, Russia and Poland, regardless of their gender.

As a result, the revealed changes of physical development changes among Belarusian schoolchildren prove once again the necessity of constant monitoring of grow-ing up and development among children and teenagers.

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HUMPOLEC

6th International Anthropological Congress of Dr. Aleš Hrdlička
150th anniversary of birth

“All mankind is of one origin“

&

Society For Connective Tissues CMA J.E. Purkynje & Society for Prosthetics and Orthotics CMA J.E. Purkynje & Czech Society of Biomechanics & Czech Medical Association J.E. Purkynje & Medical University of Lublin & Vincent Pol University in Lublin & Children’s Rehabilitation Center of Orthopaedics and Traumatology “Ogonyok”, St. Petersburg

invite you for

The 21st Prague-Lublin-Sydney-St Petersburg Symposium

topic

Orthopaedic Anthropology 2

that will be held in frame of

the 6th International Anthropological Congress of Dr. Aleš Hrdlička

in Fabrika Hotel in Humpolec, Czech Republic, September 3–5, 2019.

The Symposium will be taken place under the auspices of the president of the Czech medical association (CMA) J.E. Purkynje

Professor Štěpán Svačina, MD, DSc

&

the honorary president of the Society for Connective Tissues CMA J.E. Purkynje

Professor Josef Hyánek, MD, DSc

The Symposium belongs to education actions integrated into the life training system of physicians according to professional statute No. 16 of the General Medical Council.

International Organizers of the Symposium:

Professor Ivo Marik, MD, PhD
& Petr Krawczyk, MD
& RNDr. Martin Braun, PhD
& Professor RNDr. Miroslav Janura, Dr.

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Participants will receive the Programme of The 6th International Anthropological Congress of Dr. Aleš Hrdlička, the Supplement 2 of the journal "Locomotor System" with abstracts of all lectures of the Congress and Certificate of Attendance of the 21st Prague-Lublin-Sydney-St. Petersburg Symposium. Abstracts of lectures will be published in Supplement of the journal "Locomotor System" (electronic version, ISSN 2336-4777), www.pojivo.cz/cz/pohybove-ustroji/
More recent information about the Symposium will be available on the websites:
www.pojivo.cz & www.ortoprotetika.cz & www.IACAH.eu

ORTHOPAEDIC ANTHROPOLOGY

annotation

The topic **Orthopaedic Anthropology** covers with application of pieces of knowledge on skeleton development and its functional adaptation in orthopaedic profession. It engages in precise verification of body and skeleton abnormalities (including asymmetry), deformities and disproportions (congenital and acquired) and their development is verified by anthropometric, X-ray, densitometric, CT, MRI, microscopic, histological, histochemical, electronmicroscopic, biochemical, biomechanical, 3D scanning methods and the like. It means exact description of both congenital and acquired skeletal disorders (after injuries and/or due to metabolic and infectious diseases) at macro-, meso-, micro- and nanolevels. Archaeological material is suitable subject of investigation, too. Etiopathogenetic causes of skeleton abnormalities (gene mutations), growth diseases and genetic skeletal disorders are included in the topic.

The terminology **Orthopaedic Anthropology** was for the 1st time used by Professor Phillip V. Tobias (Johannesburg, South Africa) in 2003 when he from the status of president of „International Anthropological Congress – Anthropology and Society" (Prague-Humpolec, May 22-24, 2003) assessed the session of the Congress titled „Comprehensive approach to congenital and acquired deformities of locomotor system" by this designation.

Prague, September 14, 2018

Note: The topic of The 11th Prague-Sydney-Lublin Symposium was Orthopaedic Anthropology. This Symposium was held in the frame of the Vth International Anthropological Congress of Aleš Hrdlička "Quo vadis homo …societas humana?" in September 2–5, 2009, Praha, Humpolec, Czech Republic (Locomotor system journal, 16, 2009, no. 3+4, p. 257–258, www.pojivo.cz/pu/PU_34_2009.pdf)

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ORTOPEDICKÁ ANTROPOLOGIE

anotace

Téma **Ortopedická antropologie** se zabývá aplikací poznatků o vývoji skeletu a jeho funkční adaptaci v ortopedické praxi. Věnuje se přesnému ověřování abnormalit lidského těla (včetně asymetrie), vrozeným nebo získaným deformitám a jejich vývoji, disproporcionalitě verifikované metodami antropometrickými, denzitometrií, výpočetní tomografií, magnetickou rezonancí, mikroskopicky, histologicky, histochemicky, elektronmikroskopicky, biochemickými a biomechanickými metodami, 3D skenováním apod. Obor ortopedická antropologie si klade za cíl přesně charakterizovat vrozené skeletální vady nebo získané deformity kostry po úrazech anebo v důsledku ortopedických, metabolických a infekčních chorob na makro, meso-, mikro- a nanoúrovni. Pro výzkum je vhodný i archeologický skelet. Oblast zájmu zahrnuje genetické choroby skeletu, etiopatogenetické příčiny abnormalit skeletu (mutace genů), růstové poruchy vrozené a získané.

Název **Ortopedická antropologie** poprvé použil pan profesor Philip Valentin Tobias (Johannesburg, South Africa), když jako president „Mezinárodního antropologického kongresu – Antropologie a společnost" (Praha-Humpolec, 22.–24. května 2003) hodnotil sekci kongresu „Komplexní přístup k vrozeným a získaným vadám pohybového ústrojí".

Praha, 14.10.2018

Poznámka: Tématem "The 11th Prague-Sydney-Lublin Symposia" byla Orthopedická Anthropologie. Symposium se konalo v rámci V. mezinárodního kongresu Aleše Hrdličky "Quo vadis homo …societas humana?" 2.–5. září 2009 v Praze a Humpolci. (Pohybové ústrojí, 16, 2009, č. 3+4, s. 257–258, www.pojivo.cz/pu/PU_34_2009.pdf)

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Abstracts – Oral presentations – Posters
Symposium
Prague-Lublin-Sydney-St. Petersburg

Session 3

Opening of the 21st Prague-Lublin-Sydney-St. Petersburg Symposium

Main topic: Orthopaedic anthropology 2: Interdisciplinary approach to growing skeleton

Welcoming Speech of

Professor Ivo Marik, MD, PhD, FABI

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Chief-Editor of the journal Locomotor System – advances in research, diagnostics and therapy

Dear Ladies and Gentlemen, my dear colleagues!

I cordially welcome you at The 21th Prague-Lublin-Sydney-St. Petersburg Symposium. This year the Symposium is for the fourth time a part of the International Anthropological Congress of Dr. Aleš Hrdlička and is taken place under the auspices of the president of the Czech medical association (CMA) J.E. Purkynje Professor Štěpán Svačina, MD, DSc and the honorary president of the Society for Connective Tissues CMA J.E. Purkynje Professor Josef Hyánek, MD, DSc.

My special reception and thanks belongs to the International Organizers of the Symposium. These are:
Prof. Tomasz Karski, MD, PhD & Jacek Karski, MD, PhD from University of Vincent Pol & Medical University in Lublin, Lublin, Poland, next Prof. Mikhail Dudin, MD, DSc & Assist. Prof. Aleksey Arsenev, MD from Children's Rehabilitation Center of Orthopaedics and Traumatology "Ogonyok, St. Petersburg, Russia furthermore Petr Krawczyk, MD & RNDr. Martin Braun, PhD & Professor RNDr. Miroslav Janura, Dr., president of the International Society for Prosthetics and Orthotics, Czech Republic.

My pleasure is to welcome among us the next distinguished Czech celebrities Professor Jana Pařízková, MD, DSc, well known endocrinologist specialized on obesity, Professor Ctibor Povýšil, MD, DSc, well known pathologist specialized on pathomorphology of bone and joint disorders

and tumours, Professor Václav Smrčka, MD, PhD, plastic surgeon specialized also on hand surgery and paleopathology, Professor Miroslav Petrtýl, Eng, DSc, well-known biomechanics – specialist in functional adaptation of skeleton and last but not least Dr. Piet Van Loon from Deventer, The Netherlands, orthopaedic surgeon interested in "care to move" based on aspects of Osteovertebral and Osteoneural growth relations by Milan Roth.

I cordially welcome all colleagues, specialists of various medical branches, specialists in biomechanics, orthotics, physiotherapy and the other participants who are interested in disorders of neuro-musculo-skeletal system from different aspects.

At present, interdisciplinary approach to congenital and acquired skeletal deformities was accepted as the main line of thought how recognize the new connections regarding etiology, pathogenesis and last but not least the comprehensive and even causative therapy of genetic skeletal disorders. The new discoveries arise just at interface of scientific branches. I believe that scientific lectures will amplify our knowledge which will become a profit for our disabled patients.

My great thanks belong to the Organizing Committee of the 6th Congress of Dr. Aleš Hrdlička namely Associate Professor RNDr. Eva Drozdová, PhD, who arranged for us very interesting cultural programme.

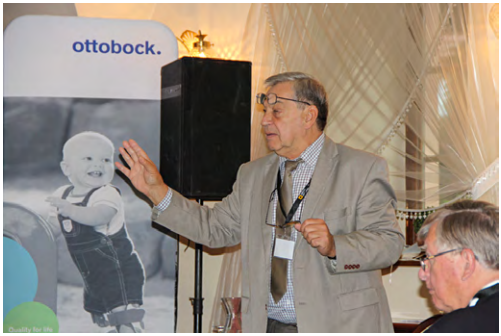
The organizers are grateful for the support of The 21st Symposium to the Partner *"ottobock."* and Exhibitors *IBI, spol. s r.o.* and *KYOWA KIRIN*.

I wish you to enjoy new scientific information, the beauty historical landmarks of Humpolec and I wish you to make new friendships which will help us to arrange international and interdisciplinary scientific research.

Now, let me a short reminiscence of a few moments that we spent together with most of you in beautiful Kroměříž in September 2018.

Look at photos.


HANDICAP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SYMPOSIUM
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Welcoming Speech of

Professor Tomasz Karski, MD, PhD

Retired head of the Paediatric Orthopaedic and Rehabilitation Department of Medical University in Lublin (1995–2009), Poland
Actually: Professor Lecturer in Vincent Pol University in Lublin, Poland

Dear Participants of the 21st Prague-Lublin-Sydney-St. Petersburg Symposium, dear Authorities of the Czech Medical Association (CMA) J.E. Purkyně, dear Friends of the Society for Connective Tissues and Society for Prosthetics and Orthotics CMA J.E. Purkynje, dear Professors, dear Doctors, orthopaedic surgeons, physiotherapist, paediatricians, general doctors gathering for the Anthropology Congress and Symposium, and also dear Professor Ivo Mařík. it is a great privilege for the Polish Group to attend the 21st Prague-Lublin-Sydney-St. Petersburg Symposium in Humpolec and special honour for me to be together with World Scientists in this Scientific Meeting – now for the twentieth time.

Here and now, I would definitely say that every scientific progress in the area of internal medicine, orthopaedics, rehabilitation, anthropology is possible only with the "friendly cooperation" and "friendly exchanges of meanings and exchange of medical observations". I am very lucky – to have such a friendly cooperation with Professor Ivo Mařík and His Team over the history of 20 years. All our work and activity is oriented to improvement the effectiveness of our treatment and reaching better results at our patients. This close orthopaedic cooperation is extremely important, profitable and effective because we can as frankly discuss the concrete problems during the Symposium as we can publish our experience and clinical materials in the Locomotor System Journal.

I would like to express my great thanks for this profitable cooperation and all the honours that have been directed to the Polish Group. I wish all participants of the Congress and the Symposium an enjoyable time in Humpolec and fruitful scientific and amicable discussions.

Greetings of

Professor Mikhail Dudin, MD, DSc

Former Director and Actual Professor consultant of Children's Rehabilitation Centre of Orthopedics and Traumatology "Ogonyok" St. Petersburg, Russia

Dear friends!

Another year flew by and we meet again on the margins of the 2019 Symposium in the beautiful Czech Republic! I believe that it would not be a great exaggeration to evaluate the main direction of the Symposium – the study of the locomotor system – a direct continuation of the traditions of one of the oldest universities in the world – Charles University. Indeed, among the first four of its faculties was a medical one, the symbol of which was the pelican. In mythology, the pelican "feeding his children" is a symbol of selfless parental love and care. And in order for our children to grow up happy, the PLSS Symposium solves one of the most important tasks – to provide them with the opportunity to walk and run, learn and play sports without interference. Unfortunately, the human locomotory apparatus has its weaknesses and a rather long range of its diseases appears at an early age. I consider it a fair idea: "All adult orthopaedics begin in childhood." I would like to wish the participants of the Symposium to take another successful step on a great and long journey – to give the young generation a healthy musculoskeletal system, so that after they grow up they will have the opportunity to "Fight-or-Flight".

Syndrome of Standing 'at ease' on the Right Leg as an important factor in the development of The So-Called Adolescent Idiopathic Scoliosis (AIS) and an influencing factor in the pathology of right Shank, Knee, Hip and Back pain

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Keywords: Syndrome of standing 'at ease' on the right leg, so-called Adolescent Idiopathic Scoliosis, pathology of right shank, knee, hip and back pain, biomechanical etiology

1. Introduction

There are various causes of the pathology of the locomotor system – congenital, connected with the Central Nerve System, bone necrosis, inflammations, overloading and other. In many patients overloading is connected with permanent standing 'at ease' on the right leg.

2. Material

The problems have been observed in more than 2500 patients – children, youth and adults coming to the University Department and to Out Patients Clinic. All of the patients had the habit to stand only or mostly on the right leg. Such way of standing has important influence on the development of scoliosis (AIS) in children and in various pathologies of knees and hips in adults.

3. Explanation of the 'Syndrome of Standing 'at ease' on the Right Leg'.

The authors describe the pathology concerning the knee, hip and spine due to "the habit of standing 'at ease' on the right leg". First observations were made in Lublin in 1997. Standing on the right leg is connected with the "Syndrome of Contractures and Deformities" (SofCD)according to Prof. Hans Mau from Tubingen, Germany. In SofCD, apart from various asymmetries and deformities, there also occur limited movements of the right hip – particularly – the adduction in extension position of the joint. In the result – children and adults have the habit of standing on the right leg because such way of standing is more conformable, easy, not forced.

4. Changes in the right shank, knee and the right hip.

Many patients have bigger varus deformity of the right shank, bigger valgus deformity in the right knee. The result – instability of the knee. The pathology of the right hip is very often connected with standing 'at ease' on the right leg. Consequently, such standing is the cause of the arthrosis of the knee joint and hip joint in older patients.

5. Biomechanical etiology of the So-called Idiopathic scoliosis and "Back pain" – connection with standing.

Standing 'at ease' on the right leg plays a very important role in the development of spine deformity. Standing and walking are the main causes of the development of "S" scoliosis in the 1st type of deformity (Lublin classification) with two curves and gibbous on the right side of thorax. Only standing is the cause of "C" – 2nd/A type - one curve in and in "S" 2nd/B type - two curves of the spine deformity. In adults permanent standing on the right leg is the cause of the degenerative scoliosis and back pain.

6. Physiotherapy is an effective method of treatment

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Anniversary lecture of Prof. Mikhail Dudin, MD, DSc

Interdisciplinary Collaboration in the Study of the children´s Musculoskeletal System: facts, reflections, conclusions

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Keywords: Interdisciplinary Collaborationin, children´s Musculoskeletal System, pediatric orthopedics

The musculoskeletal system are more than 200 solid bones providing the shape of the human body and it is believed that without them a person will become like an amoeba. At the same time, the chemical composition of the mineral component is such that the bone skeleton is the most important participant in maintaining homeostasis both in the body as a whole and in its individual organs and systems. The second integral part of the musculoskeletal system are numerous motor units consisting of contractile muscle fibers and the motoneurons controlling such a process. With the

above general information, the musculoskeletal system of children has another property - the ability to grow. If the results of studying the anatomy and the above functions of the averaged musculoskeletal system in adults are well reflected in the world literature, then obtaining such information from children for objective reasons is very difficult. However, real practice shows a high need for objective data characterizing the supporting, motor and metabolic functions in a growing organism. Actualizing this need is that a number of diseases in the field of view of both orthopedists and doctors of other specializations, according to modern ideas, are associated with the neuro-endocrine regulation of the growth and maturation of the musculoskeletal system. It should be noted here that the clinical pictures of almost all diseases with which children's orthopedists work are described quite fully. But there are no complete ideas about their pathogenesis. In order to obtain such information necessary for understanding the pathogenesis of orthopedic diseases and syndromes, techniques and technologies developed in the last 50 years and widely used in other medical disciplines are of great interest. A special example of this is ELISA. On the basis of this technology, it is possible to obtain the characteristics of quite numerous markers reflecting the processes of osteogenesis and their regulation. The range of diagnostic technologies that are non-traditional for pediatric orthopedics should include the EEG, the experience of which in the 3DLocEEG modification has already revealed the characteristics of the functioning of the corpus pineale. It is important to note that one of the problems of pediatric orthopedics is the lack of data on age-related anatomical and physiological standards, and traditional ultrasound, X-ray, as well expensive MRI can be used to solve it.

Session 4

Biomechanics – functional adaptation of human locomotor system

The impact of adaptation to hypokinesia during early growth

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Keywords: adaptation to hypokinesia, growth period, secular increased of fat deposition

The impact of adaptation to hypokinesia can be reflected significantly even under physiological and adequate health conditions since early growth when the level of spontaneous physical activity is highest, sensitivity to its reduction increased, but physiological and other results mostly undesirable. Adaptive processes concern always numerous body tissues with regard to not only present, but also delayed consequences later in life. Secular trend of increased deposition of fat as a result of hypokinesia – mostly characterized and followed by measurements of body mass index (BMI) only – has been evaluated. However, secular increase of directly measured body fat deposited relatively more on the trunk confirm also the impact of hypokinesia in children since early age even under conditions of the absence of increasing BMI, ie. latent obesity. Further changes were revealed also a with respect to e.g. unchanged circumferential measurements especially in lower extremities (thigh) along with increased skinfold thickness, revealing thus reduced development of skeletal muscles. When comparing the level of motor abilities before cca 50 years and recently (characterized by motor tests as jump, throw, etc), their level was also significantly reduced. No information is available on secular changes of the development of vital organs in the countries industrially developed, tackled mostly by hypokinesia of children. Increased prevalence of biomechanical and orthopedic problems along with various accidents focus more attention to adaptational problems of hypokinesia connected with child health.

Sedentary work – The importance of adopting and maintaining correct sitting posture. Knowledge translation

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Keywords: sedentary work, sedentary behaviour, optimal sitting posture, mainting sitting posture, knowledge translation

Knowledge translation (KT) is a concept that enables the implementation of research outcomes and evidence-based interventions into day-to-day practice. The literature showed more effective and efficient health care provision when using KT in a range of clinical areas such as falls prevention, stroke rehabilitation and care of people with dementia (Clemson et al., 2017, McCluskey et al., 2016). However, there is still more to improve when disseminating and sharing research results with the aim to provide the best practice.

There has been very limited evidence with regards the KT and the prevention of injuries and illnesses caused by sedentary lifestyle.

The literature has showed that with increasing technology, most of occupational activities have been transitioning into sedentary activities. It is common knowledge that office workers can spend over 10 hours sitting each day. There is evidence of the link between excessive sedentary behaviour and the negative impacts on the health. Numerous studies describe the external and internal factors and variables that effect the posture in sitting and the health consequences. In addition, recommendation of the optimal workstation and the environment has been described in ergonomics and anthropometry. Nevertheless, there is inconsistent evidence with regards the prevention and education on the optimal sitting posture and the physical and organisational ergonomic interventions.

Thus, it is proposed to conduct high-quality studies to determine the effectiveness of KT with the aim to improve practice and decrease the percentage of injuries and illnesses caused by sedentary work.

Improper sitting position in Children, Adolescents and Adults. Causes. Clinic. Physiotherapy

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1. Introduction

Available literature does not give any information about the ways of standing and sitting of children, adolescent and adults in the context of pathology of the locomotor system. The observations made by the authors in the years 1995 - 2018 proved that incorrect position of sitting leads to pathology of the knee, that is the instability and pain syndromes.

2. Pathology of knee joint

The causes of dysfunctions can be congenital, posttraumatic, inflammations, or chronic overload. It is very frequent that the pathology of the locomotor system is connected with the "Syndrome of Contractures and Deformities" (SofCD) described primarily by Prof. Hans Mau from Tübingen, Germany. The overload is known in medicine and can be the cause of pathology in the locomotor system but its connection with scoliosis has not been known. In the case of scoliosis, the time of

overloading while standing plays the main role. In the case of pathology of the knee, it is the incorrect position while sitting.

3. Material

The study included 98 patients presenting incorrect sitting position. The patients were both children and adults. It has been proved that the pathology of the knee can be connected with varus deformity, valgus deformity, flexion contracture or with hyperextension of knee joint. Additional pathologies mean instability of the knee which is connected with an "improper position of sitting". First observation date back to 2012. The number of patients sitting in an incorrect way in Poland varies from 10% to 15%. Whether such patients are present in other countries still remains without an answer.

4. Clinical description of the knee problem

An improper way of movement of the knee discovered during the careful examination of painful knees performed in the years 1995 – 2018. It has been found that in movement from flexion to the extension their way was not in a sagittal line but with an external rotation or with valgus direction in the final phase of the movement. The material presented in lectures, indicated the presence of numerous patients at different ages who had the habit of sitting in an improper way.

5. Physiotherapy

The rules of the therapy and prophylactics were presented in lectures. The principles of the therapy were discussed. The aim of the treatment is to avoid the improper sitting and do recommended exercises in order to improve the stability of the knee joint."

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Homo Erectus and backpain? Being Homo Sedens from birth is an unhealthy evolution! Where did Orthopaedics lost its preventive power? An illustrated pathway of Rise and Decline of medical knowledge on posture and locomotion.

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Keywords: etiology; degeneration; musculoskeletal conditions; prevention; growth; sitting; thoracolumbar spine; posture

There has never been an era in which so many people are suffering from all sorts of degenerative conditions, chronic and acute injuries and pain in the musculoskeletal systems as in nowadays "Western called" societies. We live in most countries in a prosperous time with education and healthcare-systems reachable for all and all sorts of innovations in technology the last century to please our body and mind to take over physical and mental activities. The technologic innovations did take away all earlier threats to our locomotion system: hard and heavy labour in agriculture, in manufacturing and even in households. Without wars, famine or epidemic infections there is nevertheless a tremendous and ever-increasing socio-economic burden of diseases connected with lifestyle. So new technologies resulted in new and serious threats. The summit of misery came after introduction of electronic devices that offer even the youngest child complete distraction that hinders natural life, that should be loaded with mobility.

In all countries the forecast on incidences of "chronic diseases" are of an incredible scale, especially "low back pain" and "degenerative joint arthritis" as we speak of the musculoskeletal system, but same is true about the increasing incidence in still younger generations of Alzheimer, Parkinson, ALS (amyotrophic lateral sclerosis) etc., if we speak about degeneration of the Central Nervous System.

There is progress in new drugs and interventions for those in which all these conditions show up more frequently. Scientist do go for solutions. But progress in prevention is not provided. Prevention even lost its power completely by the lack of knowledge on aetiology. And societies lost their knowledge on proper guidance of bodily development of their children in their common sense.

From the very start, with the publication (Paris, 1741) of a that time bestselling book in Europe:" Orthopaedie", Nicolas Andry de Beauregard gave a tremendous boost to an apparently new wide field in medical knowledge as it started its rise by Leonardo da Vinci. " Orthopaedie, or the Art to prevent or to correct all bodily deformities in children, by all means the Fathers and the Mothers and all those involved in raising children, have available", was the title of the book, that had its English translation in 1742 and its German translation in 1743(!). This "Art" once had tremendous power in Greek and Roman societies, where the way to bring the youth to a point of: "mens sana in corpere sano" to be reached in early adulthood, was practised thoroughly in these cultures. Christianity in Medieval times almost wiped out knowledge and drive on a men's own responsibility to take care of his own body health (form and function) and that of his offspring. In the era of booming post-Galen

medical knowledge Andry stated clearly, that it is the sitting of children on chairs and the way they do this is a main factor of bodily underdevelopment and even deformities.

Andry was the very first to observe the relation between sitting and sitting sloughed of children and the presence of spinal deformities as scoliosis. This etiologic knowledge formed the start for many interventions by himself and many followers: all sorts of corsets to guide or correct growing spines, orthopaedic doctors invented out of ergonomic and biomechanical principles school furniture, that prevent the spine from detoriating or even buckle. School gymnastics on orthopaedic principles was advised by physicians. In Germany Rudolph Virchow even pressed Bismarck to get school gymnastics on this orthopaedic base obliged in education as measures of preventive medicine by law. And in many German textbooks all the knowledge on the biological nature and needs of the growing body was described and explained I relation with all that could go wrong with clinical examination as the only "diagnostics". Only one tissue could not be researched directly even under microscope or in experimental studies (no in vivo biopsies possible), and that was the nervous system. For the revelation of the type and pathways of growth and pathologies this tissue had to wait for the research done on this by the late Prof Milan Roth of Brno (1923-2006) : the nervous cell has to grow in length and has to produce all his synapses by stretching frequently in all directions as should be provided in playing, romping, stretching out at awakening or even yawing. His osteo-neural growth relations between the Skeleton and the CNS are processes in time and under the signalling control of reciprocal tension, that cannot be made visible by even the most modern ways of diagnostics like fMRI or electron microscopy.

But we did know out of classic Orthopaedics, Hygienics and/or Biomechanics:

- Babies should get their TL spine in lordosis by frequent lying on their bellies
- Babies should not sit before their extensor muscles are strong enough to do it by their selves.
- The starting point of proper walking and gaining healthy walking patterns is the fact, that the thoracolumbar joint comes (and stay) into lordosis.
- Flexed (kyphotic) sitting postures (sloughed, slumped) should be avoided during the complete period of growth because the weight of the head and shoulders can deform young discs, young cartilage and young bone (Wolff's Law).
- Sitting on a chair in 90^0 in hips is unnatural. It causes backward tilting of the pelvis and loss of the lumbar (protective) lordosis and the TL joint can become contracted in kyphotic position (Sitzbuckel), producing overload in discs.
- Children (and adults) should do daily body exercises to maintain all length of structures, all full range of motion, enough muscle strength to be resilience against all challenges the body will face in a day in a natural world. All cultures on Earth provided, facilitate or stimulated this to their offspring.

If restoration of these advises can return in broad education of children, the chance prevention will be effective by this and the socio-economic burden of diseases will diminish will predictably be great. The world of science, especially neuroscience can provide intelligent research to give support in depth, maybe even in nanotechnology, of the rightness of this common sense measurements. And if our children had to sit, let it be only in an active way, self-balancing on their sitting bones.

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Session 8

Patho – biomechanics – diagnostics – orthopaedic prostethics

Cuneiform vertebral deformation in patients with AIS

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Keywords: scoliosis, deformation of the vertebrae, sprouting zones, the law of Hueter-Volkmann, treatment of scoliosis

The emergence and progression of scoliotic deformation is accompanied by typical morphological changes of the vertebrae with the formation of lateral wedge-shaped bodies at the top of the scoliotic arc. This phenomenon is fully explained by the law described by Carl Hueter (1838–1882) and Richard von Volkmann (1830-1889) in the middle of the XIX century. From the point of view of this law, the transformation of the form is due to changes in the mechanical vertical load on the sprouting zones of the epiphysis of the vertebral bodies: there is an „increased" activity of osteogenesis on the convex side, and on the concave side of the scoliotic arc, its slowdown occurs. It should be borne in mind that the x-ray image does not fully shown the real three-dimensional changes. Thus, there is a „start" of the „vicious circle": the greater the lateral deviation of the vertebral complex, causing the asymmetry of the vertical load on the apophysis of the vertebral bodies, the more conditions for the development of wedge, but the greater the wedge, the greater the deformation of the bearing column of the vertebral complex. This gives grounds to consider the growth side of residual wedge angle of vertebrae unfavorable prognostic criterion. The only method of confrontation with this phenomenon is considered to be surgical. In this paper, an example of reducing lateral deformation of the vertebral bodies against the background of a step complex conservative treatment is given.

Possibilities of orthotic treatment in children with cerebral palsy

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Keywords: orthotic treatment in children, cerebral palsy

The application of orthoses places high demands on interdisciplinary cooperation and the experience of individual members of the therapeutic team. The limb orthoses are applied in the context of conservative therapy to stretch the abrupt muscle groups and subsequent positioning. The choice of the orthosis must always be based on the basic functional evaluation of the locomotive apparatus

in all levels. It is equally important to determine the mode of application of the aid during the day depending on the ongoing rehabilitation care.

The use of orthotics in postoperative care depends on individual types of surgical procedures. Orthoses in these cases ensure that the range of motion and centration in the joints are maintained, helping to create a muscle balance between antagonistic muscle groups to ensure and maintain the postoperative effect on soft tissue or skeletal correction.

The success of orthopedic and orthopedic-prosthetic care largely depends on the close interdisciplinary cooperation of an indicating physician - a neurologist, orthopedic, rehabilitative physician, orthopedic-prosthetics, physiotherapist, occupational therapist and orthotic prosthetics who works to produce and apply the aid. The most important thing is the cooperation with the patient and family members, who should be educated about the course and treatment strategy. Only this cooperation will provide very necessary feedback on the effect of treatment, the use of the device and any changes in health that require adjustment of the therapeutic procedure.

Evaluation of the brace treatment effectiveness in patients with progressive scoliosis

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Keywords: brace treatment effectiveness, progressive scoliosis

Introduction

According to the recommendations of SOSORT 2016, brace therapy is scientifically proven method of spinal deformities treatment. A large number of articles with an analysis of the results of the brace technologies use are published in the world. Unfortunately, in Russia the protocol (clinical guidelines) for the conservative treatment of scoliosis has not been developed yet. And there are only a few works that determine the effectiveness of brace therapy in the short-term and long-term periods. Objective is the evaluation of the brace treatment effectiveness using Cheneau technology in the first 6 months of brace treatment.

Material and methods

A survey of 168 patients with idiopathic scoliosis of varying severity was carried out. The age of patients at the beginning of treatment was 5–17 years. The size of the frontal curvature on the antero-posterior radiographs in the standing position at the time of the beginning of brace therapy was 25° – 72° to Cobb's angle. The magnitude of the pathological rotation of the apical vertebrae bodies was assessed according to the Raimondi's table. The risk of probable progression of spinal column deformity was determined according to the table by Lonstein and Carlson. The degree of bone maturity was determined by Risser's and Sadofieva's tests (R-0 - R-IV and S-0 - S-III, respectively).

Cheneau braces were made to all the patients. Brace therapy in conservative treatment of patients with progressive forms of scoliosis has been used since 2005 in Ryazan. After the 6-month period of wearing a brace an X-ray examination of the child's spinal column state was performed in a brace while standing in the anteroposterior and lateral projections.

Results and discussion

After 6 months of brace therapy a positive dynamics was revealed in all the patients. The reduction of curvature by 30-50 % and higher was observed in 116 children, by 20–30 % - in 43 patients. The primary brace correction was less than 20% in 9 patients with severe scoliosis (Cobb angle above 60 °), patients with rigid deformities and overweight. The intensity of the correction degree depends on the initial value of the curvature, its anatomical type, mobility and bone plasticity of the child's organism. The best results were found in children with scoliosis not higher than 35°, in which the primary correction of the deformity averaged 46%. A decrease in the pathological rotation of the vertebral bodies (by 4°–15° according to Raimondi) was noted along with a decrease in the frontal curvature. A significant change in the sagittal profile in patients in the period of primary correction was not marked. The regimen of wearing a brace in the adaptation period for each child was set individually, generally not less than 20 hours a day after 3–6 weeks of wearing with the obligatory night stay in the orthosis. A faster adaptation to the brace was observed in patients who, prior to its use, were engaged in specific scoliosis exercises according to the method of Katharina Schroth. The first brace correction was carried out 3–4 weeks after the start of treatment, then after 3 months. As a rule, this is a reinstallation of fasteners and the installation of bandages to enhance the correcting pressure of the product. After 6 months of brace therapy a decrease in body asymmetry and an increase in psychological self-esteem were marked in the majority of patients.

Conclusion

The obtained short-term results of using brace technologies show their effectiveness in the treatment of progressive forms of idiopathic scoliosis.

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Design of spinal brace shape classification

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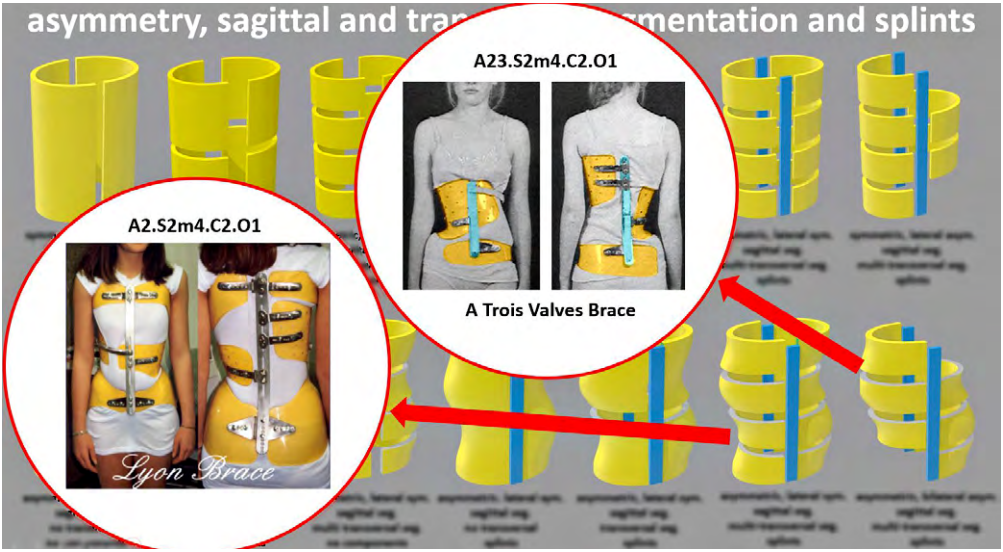
Keywords: spinal brace, orthosis, shape, classification, design, reversibility

In the past year, the work for a new classification of corrective spinal braces has been launched to unify and refine the most relevant criteria. This requirement is addressed by SOSORT across other companies such as SRS, ISPO, POSNA and others. The approved basic criteria include overall action, anatomy, rigidity, corrective plane, valve and closure. Unfortunately, at this stage there is no room for shape and design solutions.

The presented classification design may be another extension of the official basic classification. The design classification should give the possibility of identifying the type of corset based on the shape design on first view. Our aim is using possibility of reversibility so that it is possible to obtain a rough design of the shape and design of the spinal brace based on the classification formula, as well as using the Cobb spine curvature measurement. Indeed, if we have the usual Cobb's sentence of deformity, then we know the localization and size of the curves and it is therefore possible to draw the approximate shape of scoliotic deformity. The main requirement of our classification is uniqueness simplicity, relevance and versatility. There are considered as important parameters in our design: symmetry/asymmetry (A), outline of edges (E), segmentation (S), components (C) and fastening (F). A formula has been created where these parameters are written by group so as to best describe the spinal brace. Design and construction of any spinal orthosis can be written into such a formula. You can then create a rough brace design at any time.



If we evaluate the spinal orthoses known so far, then we get unique classifications in the sheet, which proves the intention of the work.

Prospects of application of 3d scanner in terms of children's orthopedic center

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Keywords: 3D scanning, musculoskeletal system, posture, scoliosis, diagnostics.

Abstract

Clinical evaluation of orthopedic status in patients with diseases of the musculoskeletal system is the result of visual examination, palpation, percussion and the results of special clinical tests [**1,2**]. The reliability of such a diagnosis is enhanced by the use of objective methods of examination. In patients with orthopedic profile is very relevant information obtained by fixing the appearance, shape of individual parts of the body or the patient as a whole, as well as the results of anthropometry. Many years of experience in the use of medical diagnostic technologies such as computer optical topography, stereophotometry and developed by us the technique of "Smart Ortho" indicate the prospects for the development of these diagnostic methods [**3,4,5**]. The perspective development of this direction is the practical application of 3D scanning for the diagnosis of patients with pathology of the musculoskeletal system. The purpose of this study – evaluate of the experience of using 3D scanner in a children's orthopedic center.

Material and methods

The material for this study was the results of observations of randomly selected representative group of 62 patients of children's rehabilitation center 'Ogonyok' aged 12 to 17 years. Most patients had posture defects: 42 patients with scoliotic posture, 15 patients with enlarged thoracic kyphosis and 5 patients with different lengths of the lower limbs. A portable scanner "3D-Sense"was used to obtain a three-dimensional model. The patients ' torso and limbs were scanned. The resulting 3D model was subjected to software analysis and measurement. As a software application, the standard application that comes with this scanner model for the Windows operating system is selected. The quantitative parameters were estimated using the program package Netfabb basic 6.4.0.

Results

In the course of the study noted a fairly high quality of the 3D models. That allowed to compare the model of patients during treatment, dynamic observation and that has a special value – reliable fixation of changes in anthropometric parameters in adulthood and puberty of both healthy and sick children. It is noted that 3D visualization technology has a competitive advantage over similar diagnostic methods, such as computer optical topography. For example, when performing functional tests, the qualitative and quantitative characteristics of the most important clinical manifestations

of scoliotic deformation were determined: rib hump and paravertebral "muscle roller". It should be noted that the visualization and logging of clinical symptoms associated with the volume characteristics of the torso and its asymmetries can not be implemented by other methods of diagnosis. The use of 3D scanning has clearly demonstrated the ability to monitor changes and such parameters. Special attention should be paid to the possibility of integrating the results of 3D scanning with classical radiological methods of diagnosis and the formation on this basis of realistic models of patients with long-term prognosis of disease. The emerging database has secure access for the benefit of interested users.

Conclusion

3D models open wide prospects for comprehensive assessment, monitoring and forecasting of the development of musculoskeletal pathology. 3D scanning allows you to document both the one-time state of the musculoskeletal system of the patient, and its changes in dynamics. The technique is harmless to humans, allows you to quickly obtain relevant information and is available for wide application. Improving the technical capabilities of 3D scanners will contribute to the development of new diagnostic areas.

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Session 11

Biomechanics – bone diseases – diagnosis

Piezoelectric effect in bone during extracorporeal shock wave therapy in experiment

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Abstract

The fact of piezoelectric properties of bone tissue is known. However, still not fully explored opportunities and methods of practical application of these properties of the bone. The work was carried out to assess of shock-wave therapy (SWT) on the electrical properties of bone tissue. There are various publications on the mechanisms of action of shock-wave therapy on bone tissue. The vast majority of these works are devoted to the biochemical aspects of shock wave therapy and justify the effectiveness of this method to improve neovascularization and enhance the growth factors of angiogenesis and osteogenesis. At the same time, there are not fully disclosed mechanisms of bone metabolism. It should be noted that even less studied piezoelectric and associated effects, in light of their impact on the bone growth zone in children and adolescents. The experiment was conducted on the native material of pork bone (similar in its characteristics to human bone). As the source pulse used device Storz Medical Masterpuls 200. The signals were registered using a standard analog-to-digital Converter. The study found that the application of shock-wave pulses to bone tissue causes the appearance of electrical potentials in it, which are associated with the piezoelectric properties of bone tissue. During the experiment using the SWT apparatus, a pattern not described in the literature was found: the amplitude of piezoelectric pulses decreases exponentially with increasing distance between the apparatus applicator and the bone.

Keywords: shock wave therapy, piezoelectric effect, bone tissue, spine, scoliosis, regulation of metabolism.

Introduction

From the point of view of classical osteology, the restructuring of bone tissue under the influence of load is regulated by the law of Hueter-Volkmann and Wolf's law. It is believed that the specific mechanisms of regulation of bone metabolism involved piezoelectric properties of bone tissue, through which the transformation of the bone in accordance with the current loads. Currently, the researchers hold the view that the piezoelectric properties of bones are due to the presence of more hydroxyapatite and less collagen, and are associated with mechanical stress. At the same time, the mechanisms

of bone metabolism realization remain not fully disclosed. It should be noted that even less studied piezoelectric and associated effects, in terms of their influence on the bone growth zones in children and adolescents. And it is perspective for practical application in children's orthopedics.There are various publications on the mechanisms of action of shock wave therapy on bone tissue. The vast majority of these works are devoted to the biochemical aspects of shock wave therapy and justify the effectiveness of this method with improved neovascularization and increased growth factors of angiogenesis and osteogenesis. We believe that shock wave therapy is one of the most effective and physiological ways to influence the metabolism of bone tissue and its growth.

Material and methods

An experimental study was conducted in which the influence of radial shock wave therapy on the formation of piezoelectric currents in the native bone was evaluated. The material for the study was selected macropreparation of the native pork femur. The bone was dissected with the removal of soft tissues. Was formed of bone segments from areas of diaphysis and metaepiphysis long 8–10 cm. A pulse from the radial shock-wave therapy apparatus (R-SWT) (Storz Medical, MASTERPULS 200), an applicator (acoustic lens) with a diameter of 15 mm, with a frequency of 1 Hz, was applied to the bone in the transverse direction to its axis. Pressure of applied pulses is up to 5 bar. The opposite ends of the bones were connected to the input of the analog-to-digital converter from the hardware-software complex "Valenta" (ECG module). The electrical signal from the bone was recorded in a temporary ECG recording mode.

Results

When exposed to radial shock wave therapy (R-SWT) on bone tissue, electrical impulses occur. The maximum amplitude was recorded when the shock-wave pulse was applied to the bone diaphysis, and the value of the potential difference at the ends of the bone (from which the potentials were recorded) reached 25 mV. The recorded parameters of electrical activity on the metaepiphyseal zone of the bone were slightly less (2–4 once) than with the same force of the shock pulse applied to the bone diaphysis. The amplitude of the piezoelectric pulse recorded from bone tissue exponentially decreased when muscle or tendon tissue was placed between the emitter of the shock-wave apparatus and the bone. This fact must be taken into account when choosing the point of application and the type of shock wave therapy used, because in natural conditions between the bone and the shock wave emitter there are always various soft tissues (from a few millimeters of skin to multi-centimeter layers of muscle and subcutaneous fat).

Discussion

Thus, among the possible mechanisms of action of shock wave therapy on bone tissue are piezoelectric effects, which in turn can determine the metabolism of bone tissue and its growth zones. The intensity of piezoelectric and associated effects depends on the force of mechanical action on the bone, which in turn is associated with the distance from the bone to the source of the shock wave or the type of shock wave used. We believe prospective to use of shock wave therapy in patients with pathology that is accompanied by a change or disruption of growth rate of different parts of the spine and extremities (dysplastic, congenital, idiopathic scoliosis, Scheuermann's disease, kyphoscoliosis, juvenile kyphosis, different length of lower limbs). The use of focused shock waves therapy should be targeted to the pathogenetic point under the control of ultrasonic navigation. Modern devices

allow you to create almost any focused shock-wave pulse of the required intensity in any area of the human body. Radial shock wave therapy will be much less effective because of the extremely fast dispersion of the pulse power when passing through deep layers of soft tissues. The choice of modes of influence of shock wave therapy for stimulation and/or inhibition of metabolic processes in the apophysis of the vertebrae or limb growth areas for practical application requires further research.

Functional Violations of Urinary System in Children with Idiopathic Scoliosis

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Keywords: children, idiopathic scoliosis, urinary system, laboratory examination.

Introduction

Idiopathic scoliosis is a three-dimensional deformity of the spine and the most frequent disorder of musculoskeletal system among the children and adolescents.

Objective of the investigation

To study the clinical and functional peculiarities of disorders in the urinary system in children with idiopathic scoliosis.

Materials and methods

A comprehensive clinical (complaints, anamnesis) and laboratory (general and biochemical urinalysis) examination of 425 children with idiopathic scoliosis at the age of 5 to 18 years with a value of deformity from 5 to 65 degrees according to Cobb was carried out.

Results

Pathology of the urinary system was detected in 44% (187 people) of children with idiopathic scoliosis, moreover in half of them for the first time. From the anamnesis it is known that only 80 people (19% of cases) had complaints of lower back pain, abdomen, had signs of dysuria. Changes in indices of the total urinalysis were detected only in 39 children (9% of all cases of children with scoliosis) of the total number of patients with pathology of the kidneys (187 people). In particular, the following was noted in 11 people with different types of dystopia: leukocyturia – 2 patients, microhematuria – 1 patient, bacteriuria – 1 patient; hyperoxaluria was observed in 5 patients, uraturia – in 2 children; in the 21st child with nephroptosis and pathological mobility, as well as in 5 patients with doubling of the kidneys. Leukocyturia was detected in 2 children with solitary cyst and ureterocele of the bladder. There were signs of metabolic disorders in the form of dysmetabolic nephropathy in 12 people (3% of cases of all children with scoliosis). Leukocyturia up to 25–30 in the field of view, microhematuria

3-5–7 in the field of view, hyperoxaluria up to the detection of calcium oxalate crystals, less often uraturia, and also bacteria and mucus were periodically detected in urinalyses of these patients. A separate group consisted of structural and functional disorders of the urinary system in children with idiopathic scoliosis, which were detected in 30 patients (7% of all cases of children with scoliosis), of which pyeloectasia occurred in 19 children, hydrocalicosis was noted in 7 cases, hydronephrosis in 4 patients. Symptoms of secondary chronic pyelonephritis were noted in 34 people (8% of all cases of patients with idiopathic scoliosis), of them: in 3 children with kidney doubling, in 2 patients with lumbar dystopia, in 8 children with pathological mobility and nephroptosis, in the 1st – with extrophy of bladder, in 5 patients with impaired urodynamics of the bladder, vesicoureteral-pelvic reflux and neurogenic bladder dysfunctions, including with obstructive-metabolic pyelonephritis - 1 girl. Half of the patients (15 people) with pyelectases, hydrocalycoses and hydronephroses suffered from chronic pyelonephritis.

Conclusions

Pathology of the urinary system in children with idiopathic scoliosis proceeds with minimal clinical manifestations and functional disorders. The ultrasound urinary system organs examination should be recommended to all children with scoliosis, even in the absence of complaints and changes in the general urinalysis.

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Features of endogenous neuropeptides in children with initial symptoms of AIS

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Keywords: Idiopathic scoliosis, endogenous neuropeptides, oxytocin, arginine-8- vasopressin, enzyme-linked immunosorbent assay (ELISA).

Introduction

Adolescent Idiopathic scoliosis (AIS) is a result of non-conjugation of longitudinal growth of the spinal cord and it's bone-ligament-muscular "sheath" [**1**]. A few spinal cord overdistension at such medullary-vertebral conflict leads to changing parameters of afferent impulses from receptive field of spinal cord to brain. Finally the hyperactive determined formation at thalamus- hypothalamus-hypophysis level has to appear to make an appropriate efferent signal. Markers of neurohumoral disorders are secreted at this situation. This endogenous neuropeptides are so called factors of postural asymmetry. It's presence at patients with AIS were proved by biotesting method [**2,3**]. Now, the main task of investigation is to estimate quantitative parameters of this markers.

Objective

Make a quantitative assessment of oxytocin and arginine-8-vasopressin at children with AIS having a course of treatment at Children's Rehabilitation Centre of Orthopaedics and Traumatology «Ogonyok».

Materials and methods

The investigation of the quantitative assessment of endogenous neuropeptides in blood serum was done. Samples were taken from children from 6 to 12 years old which had a course of treatment at Children's Rehabilitation Centre of Orthopaedics and Traumatology «Ogonyok. All children had complex clinical and instrumental examination to specify degree of scoliosis deformation. At morning, all investigating children on an empty stomach have vein blood sampling. Blood contained at vacuum test-tube with aprotinin (protease inhibitor) to ELISA. Commercial ELISA kits (PeninsulaLaboratories, LLC № S-1355, № S-1357) were precisely used according to instruction. The data were statistically processed. Children were divided on 3 groups according to evaluation results: 1) posture disorder like "flat back" (26 children) 2) scoliosis from 8 to 15 Cobb's degree (74 children) 3) children conditionally healthy (22 children).

Results

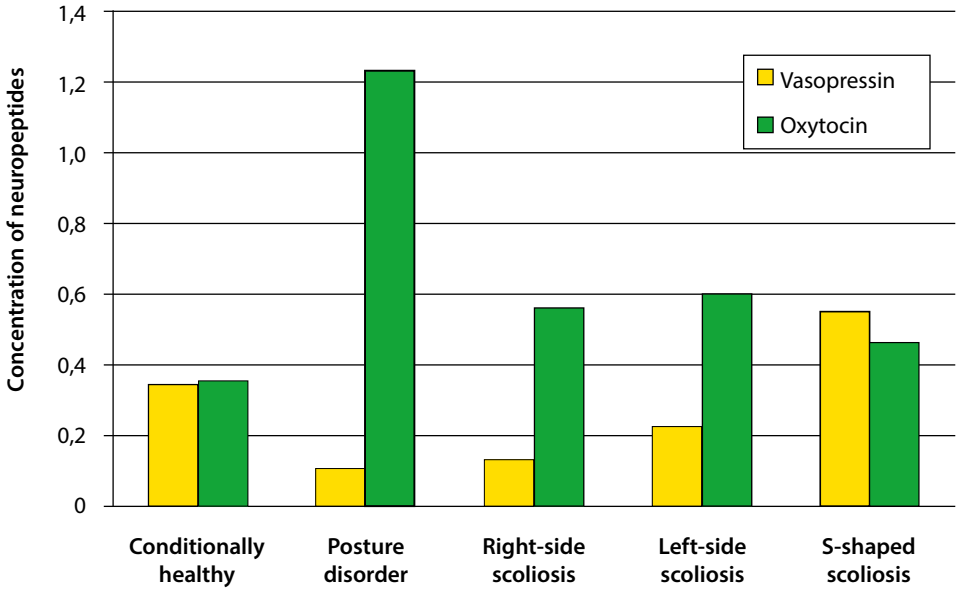
Quantitative characteristics of endogenous neuropeptides content were estimated in all groups. We didn't find any publication about normal characteristics of endogenous neuropeptides at children of this age group. Difference of oxytocin average measure is reliable. We suppose it is the most important result. This difference ($p \leq 0{,}01$), between first and others groups are represented graphically (**picture 1**).

Besides, oxytocin and arginine -8-vasopressin concentration ratio is informative. Only children in third group have this ratio 1:1. And the ratio clearly changes in other two groups. Children at first group ("flat back posture disorder) had ratio 10:1. Children at second group with left-side AIS had ratio 2:1 and 6:1 with right-side AIS.

Conclusions

The investigation of endogenous neuropeptides in blood serum of children with AIS makes new opportunities to understand AIS pathogenesis, to prognoses and prevent disease in future. The fact

of reliably high oxytocin content (physiological female regulator) at children with flat back and earlier AIS show new ways of it investigation, which probably help to answer the question "Why girls suffer from AIS four times as much than boys".



Picture 1. The average measure of endogenous neuropeptides in blood serum of different children groups

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E-POSTER – Ultrasound diagnosis of paravertebral muscles in children with AIS before and after treatment

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Keywords: Idiopathic scoliosis, endogenous neuropeptides, oxytocin, arginine-8- vasopressin, enzyme-linked immunosorbent assay (ELISA).

A feature of the paravertebral muscles (PVM) is multifunctional and organic connection with the spine. Knowledge of the anatomy, structure and functioning of these muscles in the rehabilitation system is important not only for the formation of body balance and movement, but also for the prevention and treatment of diseases of the musculoskeletal system. Our previous studies of the ultrasound characteristics of the paravertebral muscles of children with scoliosis revealed an increase in density and a decrease in the cross-sectional area on the side of the scoliotic arch. This allowed us to diagnose the muscles in scoliosis before and after treatment.

E-POSTER – Characteristics of the spatial orientation of the vertebral column, shoulder and pelvic girdle in patients 7–17 years of age with initial symptoms of scoliosis

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Keywords: AIS, computerized optical topography of the spine**.**

The descriptions of morphological changes in the vertebral column with severe three-dimensional deformity are numerous in the world literature. Meanwhile, characteristics of the initial changes observed in patients with mild scoliosis are substantially less studied.

Here we provide the data on pathological changes of the vertebral column, shoulder and pelvic girdle in a group of children with minimal symptoms of scoliosis (≥5° Cobb's scale) obtained with the optical computed topography technique.

The study included 85 pediatric patients (47 girls and 38 boys, median of age – 12.84 years) with initial symptoms of scoliosis. We used an optical computed topography technique (with the protocol for Vertebral Column Deformities evaluation, Novosibirsk) to collect the data.

The following parameters included in the specified optical topography protocol were evaluated:

a) Position of the torso parts in the horizontal plane to assess the rotation of the shoulders and pelvic girdle in the horizontal plane.

b) The parameter that characterizes the rotation of the shoulder girdle in the horizontal plane in degrees.
c) The parameter that characterizes the rotation of the pelvis in the horizontal plane in degrees.
d) The maximum height of thoracic kyphosis in millimeters and depth of lumbar lordosis in millimeters.
e) Degree of the torso flexion in centimeters.
f) The point between the thoracic kyphosis and lumbar lordosis
g) The graph of the Angles of Rotation of the Line of the Spinous Processes in the horizontal plane.

Conclusion

The findings suggest that before the appearance of a pronounced frontal arch in the vertebral column (minimal clinical manifestation of scoliosis), three interrelated processes take place:

1. The shoulder and pelvic girdles shift in the horizontal plane in relation to the frontal plane (0.2° to 17°, on average ± 4.5 °).
2. Simultaneously, the displacements of the vertebrae among themselves occurs in the horizontal plane with the formation of numerous (from two to seven) frontal arcs. The displacement mentioned above did nit exceed 10° (on average 2.3°).
3. Against the background of these displacements, migration of the level of transition of physiological curves of the spine (thoracic kyphosis to lumbar lordosis) was observed in the volume of one to two functional spinal units, both in cranial and caudal directions.

Session 13

Osteology – bone diseases – diagnosis – comprehensive treatment

Pathomorphology of crystal-associated osteoarthropathies in bioptic and archaelogical materials

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Keywords: pathomorphology, crystal-associated osteoarthropathies, bioptic and archaelogical materials

Crystal-associated osteoarthropathies are a group of metabolic disorders in which crystals are predominantly deposited in and around joints. Three crystal-induced arthropathies are differentiated: gout, calcium pyrophosphate dihydrete crystal deposition disease (CPPD, pseudogout, chondrocalcinosis) and hydroxyapatite crystal deposition disease. On macroscopic examination the chalky white deposits appear similarly in all disorders. But every type of arthropathy has characteristic histological pattern and correct identification of the type o crystals allow to make correct diagnosis. In CPPD the crystals are distinguished from gout crystals by their rhombdoidal shape, by the positive staining in von Kossa´s impregnation method and by their positive birefringence. The principles of differential diagnosis will be presented. Moreover, atypical forms of these diseases affecting bone tissue, also observed in archaeological bone in the case of Snt. Ivan, Czech hermit, will be demonstrated.

Hypophosphatemic rickets: growth and body proportions in a group of Czech patients conventionally treated

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Keywords: hypophosphatemic rickets, growth and body proportions

Hypophosphatemic rickets belong to rare diseases. In contrast to rickets caused by vitamin D deficincy, it is characterized by hypophosphatemia and normal serum levels of calcium. Characteristic clinical features include slow growth, bone pain and bone deformities. This group of diseases is

caused by mutations in various genes involved in regulating renal phosphate reabsorption (PHEX, FGF23, DMP1, ENPP1). The X-linked form is most common. For more than 30 years, treatment has consisted of the oral administration of phosphate and calcitriol. Contemporary fast technological development led to better understanding of the processes of bone mineralization and to development of new therapy.

The aim of our study was to evaluate the growth of body height and individual body segments of 29 Czech patients (20 female, 9 male) with hypophosphatemic rickets (diagnosed on the basis of clinical and radiological findings) treated by conventional methods. The patients were born 1940 – 2007 and examined during 1988 – 2018. In 21 patients the final height is known, 15 patients were longitudinally followed up during the growth period. Final height of women was 146.4+/- 10 cm , that of men 155.7 +/- 10, cm (-3.1 and -3.5 SD resp. no significant diference). Final height of patients born before 1980 was -3.68 +/- 1.8 SD, after 1980 -2.71 +/- 1.35 SD (n.s.) As expected, the substantial growth retardation occurred before 5 years of age. Further worsening of growth dynamics was observed in puberty, however the variability during puberty was considerable. Body proportions were significantly disturbed. Most patients underwent surgical treatment. Patients treated conventionally by phosphate and calcitriol significantly differ from healthy population. Existing therapy does not prevent growth retardation, disproportional habitus and bone deformities.

The orthopaedic problems connected with vitamin D metabolism: Rickets, Osteomalacia, Hypophosphatemic rickets (X-linked hypophosphataemia)

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Keywords: rickets, hypophosphatemic rickets, X-liked hypophosphataemia, clinical findings, radiological features, pathobiomechanics, conventional therapy, orthotic treatment, surgical reconstruction

The aim is to condense recent pieces of knowledge about rickets, osteomalacia and genetic rickets from aspects of diagnosis, etiopathogenesis and convetional treatment.

Introduction

Rickets represents disturbed mineralisation and desorganisation of growth epiphysis in period of growth when biomechanically severe skeletal deformities evolve.

Osteomalacia is insufficient mineralisation of trabecular and compact bone after finish of growth.

Etiopathogenetic classification of rickets and osteomalacia

Abnormal vitamin D metabolism:

1. Vitamin D deficiency: inadequate exposure to sunlight, deficient intake of vitamin D and/or dietary calcium deficiency.
2. Phosphate loss due to renal tubular disorders: *Vitamin D-resistant rickets /VDRR/ (most frequent is X-linked hypophosphatemia /XLH/)*, Fanconi syndrome, Renal tubular acidosis
3. Tumor-related (Oncogenic rickets)
4. Hepatic origin: anticonvulsant therapy, liver disease (failure of 25-hydroxylation)
5. Renal origin: renal osteodystrophy, vitamin D-dependent rickets
6. Parathyroid disorders
7. Intestinal origin: celiac disease, malabsorption

In 1937 Albright F et al. differentiated XLH from Vitamin D deficiency of infants.

Incidence of XLH is 1:20 000–25 000 live born children.

Etiology of XLH: Fibroblast growth factor (FGF23) plays important regulation function in cell signalization. FGF23 mutation inhibits renal transport of phosphate (phosphate reabsorption) and causes renal phosphate wasting. Gene defect PHEX was localized at Xp22.2-p22.1, in the PHEX around 160 mutations were identified.

Major clinical findings of rickets and osteomalacia

Short stature, bow leg and short lower limbs, waddling gait due to leg big joints malposition, protuberant abdomen, rachitic rosaries.

Infants: excitability, night sweats, muscle weakness, tetany and cramps, rachitic rosaries, pectus carinatum, Harrison´s groove, craniotabes, caput quadratum/natiforme

Toddlers: short stature, waddling gait, protuberant abdomen, bow and short lower limbs, kyphoscoliosis

Adults: osteomalacia causes increased excitability, bone pains during gait, by cough, palpation and percussion

VDRR: growth impairment, lower extremity bowing, patients do not suffer from muscle weakness, tetany and cramps unlike vitamin D deficiency. Intelectual development is not injured, adult height is in range 130–160 cm. Heart-shaped pelvis can be obstacle of spontaneous delivery.

Laboratory findings

Elevated serum concentrations of fibroblast growth factor 23 (FGF23), hypophosphatemia (dimished tubular resorption of inorganic phosphate) and hyperphosphaturia, elevated serum alkaline phosphatase levels (ALP), osteocalcine, bone ALP (BALP), parathormone (PTH) – tertiary hyper-parathyreosis, elevation of urine pyridinoline and deoxy-pyridinoline (last years is used serum CTX marker).

Major radiographic features

Rickets: mild-moderate-severe rachitic changes:

- bowing of long bones - tubular shape of long bones
- apparently wide epiphyseal plates, flare metaphyses
- sparse pattern of trabecular bone and thinner fiberized cortical bone

Osteomalacia: bell-shaped thorax, heart-shaped pelvis, kyphoscoliosis with codfish vetebrae, varous or valgous limb deformities, Looser´s zones of remodelling and fractures

VDRR: mild-moderate rachitic changes:

- deformity of long bones and spine,
- early closure of growth plates and craniosynostosis of sagittal suture.
- low bone density in childhood unlike generalized osteosclerosis in adults
- early osteoarthritis and spondylarthritis

Histology: Widening of unossified osteoid seams at the trabeculae (volume of osteoid more than 5%).

Patients and methods

Diagnosis was specified according to radio-clinical examination in years 1988–2018 in Centre for Defects of Locomotor Apparatus or in Faculty Hospital Motol in Prague. Note: FGF23 we began to investigate last year. Probands were born in years 1940–2007.

Retrospective evaluation of basic anthropometric parameters was carried out in a group of 29 XLH patients (20 females, 9 males) and their assessment is a theme of the next lecture (Zemková D et al.).

Conventional medicamentous treatment /combination of oral P and 1,25(OH)2 vitamin D/ was introduced when diagnosis XLH was specified. 14 children with biomechanically severe deformities of legs were treated by orthoses and later by surgery (corrective or multiple osteotomies with aim of 3D correction).

Results

A few results of conventional medicamentous therapy, orthotic and surgical treatment are demonstrated as short case reports.

Conclusion

Children indicated to orthotic treatment and later to surgery of legs showed significant improvement of biomechanical axis of legs. On the other hand repeated surgical procedures and late bone remodelling (healing of osteotomies in adults is about 3 times longer) present a big intellectual stress for patients and their families. Three teenagers (and their parents) refused the last surgery at the second lower extremity.

Long term supplementation by Calcitriol and inorganic phosphate is often attended by like secondary/tertiary hyperparathyroidism, hypercalcemia, hypercalciuria and nephrocalcinosis.

Adult patients suffer from generalized osteosclerosis and early osteoarthritis and spondylarthritis. Calcium and phosphate metabolism are disturbed during whole life.

We conclude that conventional treatment is not sufficient prevention of growth retardation, disproportionality and progression of skeletal deformities during growth period.

FGF23 mutation inhibits renal transport of phosphate (phosphate reabsorption) and causes renal phosphate wasting. There are encouraging studies of successful treatmnet with human IgG1 monoclonal antibody (Burosumab - KRN23) against FGF23 in children with XLH (Linglart A et al http://www.endocrineconnections.org et al. 2014, Carpenter TO et al. 2018, Imel EA et al. 2019). We hope that this perspective medicament therapy will be available for Czech patients in a short time.

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Burosumab in the treatment of pediatric patients with XLH – results of recent clinical trials

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X-Linked hypophosphatemia (XLH) is characterized by increased secretion of fibroblast growth factor 23 (FGF23), which leads to hypophosphatemia with consequent rickets, skeletal deformities and growth impairment. Efficacy and safety of burosumab, a fully human monoclonal antibody against FGF23, in the treatment of pediatric patients with XLH was evaluated in two phase 2 studies (CL201 and CL205) 1–3.

In CL201 52 subjects with XLH (5-12 years old, Tanner <=2) were randomized 1:1 to receive subcutaneous burosumab every 2 (Q2W) or 4 (Q4W) weeks with doses titrated up to 2 mg/kg to target fasting serum phosphorus levels 1,1–1,6 mmol/l. In CL205 13 subjects with XLH (ages 1–4 years) received subcutaneous burosumab 0,8 mg/kg Q2W, which was increased to 1,2 mg/kg based on serum phosphorus levels1-3. A key efficacy endpoint for each study was change in rickets severity assessed by blinded readers using two radiographic scales: Thacher Rickets Severity Score (RSS) and Radiographic Impression of Change (RGI-C).

Rickets was evident in all subjects at baseline in both studies (mean +- SE RSS: : CL201, 1,9±; CL205, 2,9±0,4). At week 64, total RSS was reduced by 58% in CL201 and by 69% in CL205 (Both p<0,0001), rickets as assessed by RGI-C score improved as well in week 64 (CL201: +1,62±0,16, p< 0,0001; CL205: +2,23±1,12, p<0,0001). In CL201 serum phosphorus levels increased from 0,8+-0,1 mmol at baseline to 1,1+-0,1 in week 64 (p<0,0001) and levels of alkaline phosphates decreased from 462 U/l to 354 U/l respectively (p<0,0001). In CL205 serum phosphorus levels increased from 0,8+-0,1 mmol at baseline to 1,1+-0,12 in week 64 (p<0,0001) and levels of alkaline phosphates decreased from z 549 U/l to 334 U/l (P<0,0001) 1-3.

In children with X-linked hypophosphatemia, treatment with burosumab improved severity of rickets, serum phosphorus and alkaline phosphatase levels.

Session 16

Disorders of growing skeleton

Congenital Anomalies in Neolithic Lengyel Culture

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Keywords: Lengyel culture, craniosynostosis, Klippel-Feil syndrome, congenital amputation of hand

The wave of the Neolithic Lengyel culture (LgC) spread at the end of the Neolithic from Tolna and the Baranya County of modern day Hungary, through Moravia to today's Poland. Through the paleopathological analysis of the LgC settlements of Zengővárkony and Villánykövesd in Hungary, and other locations in Moravia, it emerged that these were migrant populations. Proof of this are congenital skull defects, mainly craniosynostoses, which affected this population and followed its westward spread. In Moravia, on comparison with previous the Neolithic Linear Pottery culture, it was found that congenital spinal malformations were more likely to occur.

Pycnodysostosis in a Czech toddler

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Pycnodysostosis is rare genetic disorder belonging to sclerosing dysplasias. Pycnodysostosis is caused by changes in the cathepsin K (CTSK) gene therefore osteoclasts cannot effectively break down the organic matrix of bone. It is inherited in an autosomal recessive trait. The patient was referred to our department due to growth failure. He was born in 32nd gestational week, 2060g/45 cm (AGA), failure to thrive in the first 6 months of life. Due to choanal atresia and sleeping apnea he was treated and followed-up in the ENT department. At the age of 1 year he measured 66 cm (-3.3 SD), weighted 7.44 kg (-2.9 SD), weight to height was on the 56th percentile. Anthropometric examination proved short stature with short limbs, narrow chest and shoulder, relative macrocephaly, delayed closure of the great fontanelle and mandibular hypoplasia. He has short tips of fingers and onychodystrophy. Radiological examination ascertained diffuse osteosclerosis of the skeleton and acro-osteolysis of the

distal phalanges. On the basis of these findings the suspicion on pycnodysostosis was pronounced. Molecular genetic testing proved this diagnosis.

Neuroblastoma in skeletal system, tumor hypoxia, HIF-1 and chemoresistance

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Keywords: Neuroblastoma, bone metastases, tumor hypoxia, hypoxia-inducible factor, HIF-1, chemoresistance.

The most serious skeletal diseases include cancer. Primary malignant bone tumors are on the 6th place in children tumors. However, more common are metastatic bone processes in children. Many patients with neuroblastoma, the most common extra cranial solid tumor in childhood, will have metastasis in the skeleton. Until today, the majority of children presenting with high risk neuroblastoma with distant metastases have diagnosis associated with considerable (more than 50 %) mortality. New targeted therapies are crucial to improve survival.

The main driving force behind vascularization and neoangiogenesis of solid tumors is tumor hypoxia caused by inadequate blood supply. Hypoxia is one of the reasons for reduced cell death in radiation- and cytostatic-treated cancer cells. Adaptation of tumor cells to hypoxic conditions contributes to the aggressive attitude of tumors and their dedifferentiation. Hypoxia-inducible factor (HIF-1) is the main factor that is necessary for hypoxia adaptation and so targeting the HIF-1 pathway has become an important area for cancer therapy research.

Introduction to neuroblastoma

Neuroblastoma is a common and a frequently deadly cancer seen almost exclusively in children. It is a solid embryonal tumor of the sympathetic nervous system. The tumor usually begins in the tissues of the adrenal gland found in the abdomen, but may also begin in nerve tissue in the neck, chest, or spinal cord.

The clinical course of patients with neuroblastoma is highly heterogeneous, from localized tumors and spontaneous regression to early metastasizing, rapid progression, and therapy resistance. Amplification of *MYCN* gene and DNA ploidy have been used as the most reliable indicators of aggressive and treatment-resistant neuroblastoma, yet few of the high-risk tumors lack these features. Interestingly, high-risk tumors without *MYCN* amplification frequently display increased c-MYC expression and/or activation of MYC signalling pathways.

Diagnosing neuroblastoma involves staging and classifying the disease that determines treatment options and prognosis. There are various staging systems that can be used for neuroblastoma. The symptoms of neuroblastoma vary greatly depending on size, location, and spread of the tumor. The prognosis for patients with neuroblastoma is best in those whose tumor burden is small enough to be completely excised surgically and when the disease is diagnosed before age 18 months. In more than half of the patients with neuroblastoma at the time of diagnosis, the primary tumor is too large to be amenable to surgery alone or has metastasized widely throughout the body. Multiple bone metastases usually develop in the vertebrae, metaphysis of long bones and skull. Multi-agent chemotherapy, combined with radiation therapy and stem-cell transplantation, is the mainstay of treatment for these children. Even so, only 40–50 % survive 5 years after diagnosis.

After the treatment neuroblastoma can cause long-lasting side effects. These can include problems with bones and muscles, like scoliosis, osteoporosis, and other problems with chronic pain, growth and development.

Hypoxia and HIF-1

Most parts of solid tumors are hypoxic because the uncontrolled proliferation of tumor cells results in an imbalance between tumor cell oxygen consumption and tumor angiogenesis. That in turn means that most tumor cells have adapted to these conditions and can grow in a hypoxic environment. In these cells there is a dramatic shift towards anaerobic metabolism (anaerobic glycolysis) which is accompanied by an increased expression of genes coding for glycolytic enzymes and glucose transporters. Hypoxia is responsible for neovascularization of tumor areas and the new-formed blood vessels are also very important for the development of metastasis. Hypoxia-induced resistance to cisplatin, doxorubicin, etoposide, melpahalan, 5-flouoruracil, gemcitabine and docetaxel has been reported in a number of experiments Ref. In our work we have shown previously the hypoxic resistance of NB cell lines to cytostatics cisplatine and ellipticine.

The main factor that is necessary for the adaptation to hypoxic environment is the protein called hypoxia-inducible factor-1 (HIF-1). It regulates the expression of over 100 genes that mediate the adaptive response of tumor cells to hypoxia. HIF-1 is continuously expressed in hypoxia despite an overall decrease in global protein translation. There are also several mechanisms in some types of tumors that regulate the stability and activity of HIF-1 in an oxygen-independent manner. This happens for example as a consequence of growth factor signalling or in cells with defects in pVHL tumor supressor protein that regulates the activation of HIF-1.

Results

There are some ways how to prevent the activation of this transcription factor and so the transcription of HIF-1 target genes. For example, we can use small molecule inhibitors or RNA interference. In our project, we focus primarily on *in vitro* study of neuroblastoma derived cell lines and their hypoxia induced resistance to commonly used cytostatics, which is a major cause of anti tumor failure in children.

We have found out that using siRNA is the most suitable for our experiments and that HIF-1 inhibition itself is responsible for the growth supression of three neuroblastoma studied cell lines (UKF-NB-4, Kelly, SK-N-AS) (Preliminary results in **Fig 1.**). We observed lower hypoxia-induced resistance to cis-

platin after HIF-1 inhibition, but not its absolutely withdrawal, which is consistent with our previous results, when we used small-molecule HIF-1 inhibitors and shRNA gene silencing (results are not shown).

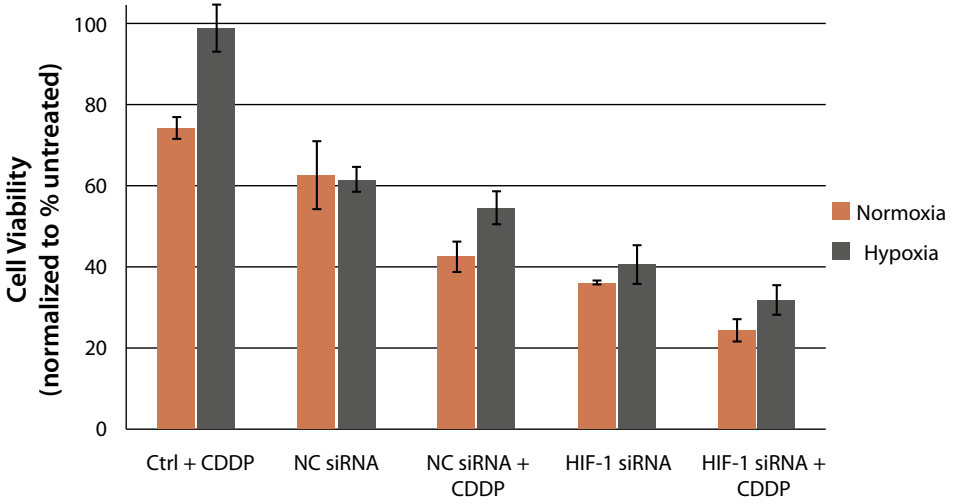

Fig 1. UKF-NB-4 cells were treated 48 h with 20μM cisplatin (CDDP) in normoxia or hypoxia (1 % O_2) and then analyzed by alamarBlue® - Cell Viability Assay. Cells were transfected with non-coding siRNA (NC siRNA) or HIF-1 siRNA, 24 h prior treatment. Similar results were observed in other studied NB cell lines. HIF-1 silencing has been verified by flow cytometry and Western blot analysis (data not shown).

Conclusions

great advancements have been made, but cancer is still the leading cause of death. Hypoxic environment in solid tumors is the reason for unsuccessful chemotherapy. Hypoxia-induced resistance to commonly used cytostatics has been reported in a number of experiments. That´s why understanding the regulatory mechanisms of HIF-1 and inhibition of its activity may have an impact on more efficient treatment of malignant tumors. We have shown that inhibition of HIF-1 itself can suppress the growth of neuroblastoma cells and their chemoresistance to some antineoplastic agents, like cisplatin, but not completely. The adaptation to hypoxia requires many genetic and biochemical responses that regulate one another. Hypoxia-induced resistance is a very complex field and still, we know only little about it. Therefore, we want to focus on exploring also other factors involved in hypoxia-induced chemoresistance in neuroblastoma, both dependent and independent on HIF-1. The results will contribute to the understanding of the biological properties of neuroectodermal tumors, especially the hypoxia-induced resistance to cytostatics. The detection of some proteins can provide important prognostic features allowing subsequent individualization of anticancer therapy where such proteins could serve as new drug targets.

Prompt medical attention and aggressive therapy are important for the best prognosis. Continuous follow-up care is essential for a child diagnosed with neuroblastoma. Side effects of radiation and

chemotherapy, as well as recurrence of the disease, can occur in survivors of neuroblastoma. New methods are continually being discovered to improve treatment and to decrease side effects.

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Perthes Disease and Femoroacetabular Impingement in a Growing Patient

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Keywords: Legg-Calvé-Perthes**,** femoroacetabular impingement, physiotherapy, rehabilitation

Introduction

Legg-Calvé-Perthes disease (LCPD) is described as a condition of unknown etiology affecting the development of femoral head where the vascularity of the femoral capital epiphysis is disrupted by yet undefined mechanism/theory (e.g. coagulation abnormalities, femoral head blood supply, the 'Predisposed' child, attention deficit and hyperactivity disorder, trauma, hereditary or environmental influences) with resulting epiphyseal osteonecrosis and chondronecrosis, followed by resorption of necrotic tissue, repair and remodelling The hip may recover fully without further hip problems later. But there are also patients with growth disturbance of the femoral head and altered shape of the normally round femoral head (top of the thigh bone) may end up with femoroacetabular impingement (FAI) syndrome a motion-related clinical disorder of the hip with a triad of symptoms, clinical signs and imaging findings. It represents symptomatic premature contact between the proximal femur and the acetabulum. [2]

Methodology

On the basis of studying available literature and long-term monitoring of two patients with a disease m. Perthes, pseudo-Perthes we would like to highlight the importance of the interdependence of health professionals and possible complications arising during growth of the patient. Literature search strategies were developed using medical subject headings (MeSH) and text words related to LCPD and FAI and rehabilitation/ physiotherapy. The database used for search were MEDLINE (OVID interface,1948 onwards), EMBASE (OVID interface, 1980 onwards), the Cochrane Central Register of Controlled Trials (Wiley interface, current issue) Science Direct (Elsewier interface) and Spiringerlink (Suweco). The monitoring of probands took place in the Centre for Defects of Locomotor Apparatus; Prague; Czech Republic. Both cases were compared with the therapies found in databases.

Discussion and conclusions

There is a paucity of evidence on rehabilitation/ physiotherapy during conservative care, during remodeling phases and as well as postoperative rehabilitation. If such studies exist, they are mostly limited to increasing/maintaining the range of motion and increasing/maintaining muscle strength [3,4,5]. We did not find any study would discussed/explores rehabilitation as a positive formative effect on hip joint structures (bone, soft tissues), or kinesiological contexts associated with growth failure or unequal length of legs in LCPD. Despite this, we believe that rehabilitation would be as effective as biological treatment strategies which can improve the healing process by decreasing bone resorption and stimulating bone formation appear promising in nonhuman preclinical studies.[6] There is possibility to use physiotherapy techniques based on concepts on the neurodevelopmental basis (e.g. NDT[7], DNS[8], PNF[9], Vojta[10]) These techniques use body position, direction of movement, load,

pressure and thrust. In this way, we can use formative bone effect according to Wolf's law [11]("Utah paradigm of skeletal physiology"[11]) precisely in order to optimally develop / remodeling of the hip joint.[8] In this way, we will be able to causally solve the problem of bone remodeling and reassess the still used recommendations of general maintenance / increase in the range of motion and strength. In addition to the problems directly caused by femur head necrosis, it is necessary to search for kinesiological contexts such as, the chainning of muscular dysfunctions in unequal leg lengths or painful patterns behaviors[12]. Patient's care from our participants in all medical facilities in the Czech Republic was no different from in comparison with other evidence found during the literature review. As a choice of prevention, we will propose special rehabilitation techniques that focus on the formative components of the hip joint at the time of remodeling as well as during the patient's further lower limb growth.

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50th Anniversary of Dega pelvic osteotomy in treatment of DDH – dysplasia, subluxation or luxation of the hip joint

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Keywords: Dega pelvic osteotomy, developmental dysplasia of hip – DDH

DDH and especially hip luxation is serious problem of humans, affecting to whole life. Many surgeons has tried to improve treatment. In operative treatment, the best method is pelvic osteotomy. The best are osteotomy according to Salter, Pemberton and Dega. In Pediatric Orthopedic Department we use mostly Dega method

In the Pediatric Orthopedics Department in Lublin in the years 1970-2000, 979 repositioning-reconstruction surgeries of the hip joint were performed due to developmental dislocation of the hip joint. Among them we had 523 open hip reductions where Dega osteotomy with derotation osteotomy of proximal femur was used. In 261 other hips we performed isolated Dega osteotomy with derotation osteotomy of proximal femur. In last 35 patients only isolated pelvic osteotomy according to Dega method was carried out.

The proper direction of the osteotomy is curvilinear starting above the anteroinferior iliac spine, to reach a point superior to the midpoint of the acetabulum and then continuing posteriorly to end approximately in front of the sciatic notch.

Dega osteotomy requires surgery which leaves the hinge at the base of the bone incision with the intact sciatic notch. Such procedure allows to achieve a large angular displacement after inserting the graft into the osteotomy incision. Described surgery was not always successful. In rare cases the reduction of roof slope was lost due to the redislocation of the graft or its lysis. Sometimes the hinge was not efficient and posterior portion of the inner cortex was not left intact.

In our follow-up in spite of the uncertain early result of the osteotomy, it turned out that there was a favorable reconstruction of the acetabular roof with full coverage of the femoral head. The authors analyze these beneficial long-term results, present the view that direction of the osteotomy incision plays a significant effect on the future reconstruction of the acetabular roof. The paper presents radiological examples of the development of the acetabular roof after Dega pelvic osteotomy.

The osteotomy according to Dega is an effective and long-lasting method of dysplastic, subluxation or luxation of the hip joint."

Anthropology and the physical presentation of Homo sapiens in the 21th century. Modern man and his posture.

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Keywords: Anthropology; posture; degeneration; burden of diseases; orthopaedics; growth; spine; natural philosophy

A short survey on this topic around 'posture' from orthopaedic and biomechanical knowledge on Health, Hygienics and Prevention.

Some people, even scientists state that the human species is degrading on a never seen scale. Can that be true?

If Anthropology is the scientific study of humans and human behaviour and societies in the past and present, then the above question is hardly to answer in present times. You have to wait for the future. For the human species in this part of the world, called "Western", massively followed by all quick economic evolving societies on other continents, every decade now has its own rapidly changing common style of life, so that studies started in one, can be seen as outdated in the next. Or can we conclude, that many fields of science are not so much leading us into the future, but only describes what history of Nature is, and that humans then are only a part of this Natural history of life. Can the physical part of human life, the anatomy in Morphogenesis and the functional part in Physiogenesis follow, or adept to all these external or environmental factors? It are the external factors, Nature or Nurture based that have to transform the individual genotype in the much, much more individual arranged phenotype? Is the huge increase of pathological conditions that threatens societies according to the Global Burden of Disease statistics as funded by the Bill and Melinda Gates Foundation part of "adaptation" of a species or just the contrary: a tragic accumulation of individuals that were not fit enough to accommodate the imposing external factors as a temporary phenomenon?

Many philosophers warned and still warn for problems or even the decline of what we call "Western societies" by the tremendous changes in lifestyle and behaviour by rapidly on each other following innovations, inventions and new functions in technology, like Nietzsche and Marx. Oswald Spengler wrote in the Interbellum his magic but difficult understandable "Die Untergang des Abendlandes", or "the decline of the West' about a quit pessimistic "end" of western cultures (the western European and Northern American countries). In his "Der Mensch und die Technik. Beitrag zu einer Philosophie des Lebens, 1931, he gives some interesting clues. His modern follower in many of these thoughts can be seen in Yuval Noah Harari's Homo Deus: A Brief History of Tomorrow (2016) and "21 Lessons for the 21st Century"(2018). Both writers do miss basic medical knowledge in understanding of the way humans have to grow/ develop to healthy, resilient and in body and mind durable adults. We seem to survive, but by the cost of what? Did the general state of health of people declines by cosmo-stelluric or gross climate changes? Is that reversible? Will the intelligence of our species find technologies to overcome this all? Or is there something wrong (almost global) in the way we raise our offspring and let them suffer from all technological "progress" and Artificial Intelligence? And what is the role in technical progress exactly in that?

Does a society or a complete population changes because of new technologies, is there a common or shared phenotype by that, or should we stick to more biologic knowledge, maybe stated best by Rudolph Virchows: " Omnis cellula et cellula", or the Cellular Pathology as this "Pope of medicine" in the nineteenth century quoted as the start of mainstream western Medicine in understanding pathologic conditions and diseases. What is true for the Individual cell can become true for the complete organism build on the gathering of all these cells, once started as one single fertilized ovum, he more or less stated. The more cells are infected by pathogens or damaged by chemical stuff, the higher the chance the organism gets sick or even will die. Protect young organisms against pathogens, poisonous (bio-)chemical stuff, but especially human children from effects of an immobile and sedentary lifestyle.

The scientific world was well aware of the consequences of Darwins Evolution Theory and the medical world accepted that Ontogenesis was only a "copy" of the individual pathway that in billions of years evolved and was concepted as Phylogenesis or the Origin of Species.

Species can change or adapt in morphology and/or function (skills) by gross changing in environment like after natural disasters, inflictions of meteorites with Earth, climate changes, drought or flooding, as we did accept after Darwins and others observations. But what if only gradually more and more individuals have to react or adapt for changing factors in their own or shared surroundings. Like our pets, that are fed by their keepers, will have easily other phenotypes (fatty, slow, less resilience, human diseases) than all other wild living dog- and catlike animals in the surrounding woods. If offspring of well-fed pets will be raised in free nature all the phenotypical changes in their parents will not be present anymore. What will be the future of our species? Many generations in the last fifty years do show early degenerative changes. Can their offspring be saved? The human species is the only one that can change its environmental world without being conscious in thoughts if this will benefit or harm its health or the health of its offspring. Will all modern world morphological presentation in humans be permanent and will only the obese or arthritic survive? Do we have to wait to moment till a majority will show these adaptations or will these alterations only be a change, even of temporarily art, in a part of a population and can it be mostly reversible or even disappearing in new generations? Let's ask the doctors that look after the visible morphology and thus posture and locomotion!

Out of the classic knowledge of Orthopedics we learned how to raise children as healthy as can be by protect them against all external factors that can hinder proper development of their Anatomy (posture) and their functional abilities as flexibility, healthy gait, muscular strength, a full range of motion of all joints, capacity of balance and a well trained propriocepsis. It is still in Hefti's textbook Pediatric Orthopedics. The first Italian female physician, Maria Montessori, now mostly remembered as innovator in Pedagogy, even stated firmly that if these "right way of bodily development was optimized also the cognitive and learning capacity as well as the development of a fine character was to be achieved easily". There should be an equal role in science and common sense for the biomechanic part of health (on motoric skills and posture) together with the biochemical part of health (on food, drugs, alcohol, tabacco and pharmacological solutions) to cme to healthy people again.

If the medical world in Western countries looses much of this combined knowledge on integrated guidance of growth and development of body and brains, the lack of prevention by that will inevitably lead to more and more children (analogue to cells in sickness) that are not healthy and will need

more and more expensive medical care, and together they will consume a great deal of countries Gross National Income and form a threat to their economies and future.

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Professor Tomasz Karski, MD, PhD – octogenarian

Professor Emeritus since 1st October 2009 **Former Head of Pediatric Orthopedic and Rehabilitation Department of Medical University in Lublin (1995–2009). 58 years orthopedic activity to 2019.**

Professor Tomasz Karski was born in January 2, 1939 in Rudka / Zwierzyniec / Zamość district (southeast part of Poland). Primary school in Zwierzyniec, secondary school in Zamość. In the years **1956–1963** study on Medical University in Lublin.

In **1963** he received medical doctor degree. During the studies he worked 3 years in Students Scientific Orthopedic Association and later after graduation he began orthopedic activity.

In **1967** first grade of specialization, in **1971** second grade of specialization in orthopedics, orthopedic surgery and traumatology of movement apparatus.

In **1972** and **1982** he passed degrees to receive **PhD** degree and **Associate Professor** title.

In **1993** he was nominated for Professor and President of Poland confer him the scientific degree Professor ordinaries (full Professor).

Since **1995 till 2009** he was a Head of Chair and Department of Pediatric Orthopedics and Rehabilitation of Medical University in Lublin/Poland. It is the biggest University Pediatric Hospital in Eastern Poland (USzD in Lublin).

He is a member of Polish Orthopedic and Traumatology Association (PTOiTr) since 1963. For 12 consecutive years he was elected as Secretary of Lublin Branch (Section) of Polish Orthopedic and Traumatology Association, for 4 years he was Vice-President of the Section and for next 4 years he was President of the Lublin Section. He works in Editorial Board of Polish Hand Surgery, of the Journal of Paediatric Orthopaedics part-B (till 2004), of *Biblioteka Ortopedii Dziecięcej* (Pediatric Orthopedics' Library) and of the journal Locomotor System – „Pohybové ústrojí" (Czech Republic). In the years 2009–2019 he is a Reviewer – Member of Editorial Offices of many Scientific Journals in USA. He is a member of EPOS since 1985 and a member of *Société Internationale de Chirurgie Orthopédique et de Traumatologie* (SICOT) since 2002.

Scholarships abroad: Orthopedic Departments: Neuruppin (German Democratic Republic – one month every year in years 1963–1972), Heidelberg (1972) – together 10 months & Essen (1973) – as DAAD scholarship holder, Budapest (one weeks – many times), Hajduszoboszlo (Congress), Szekesfehervar (Congress), Brno (one month), Neubrandenburg (German Democratic Republic Congress), Chemnitz (Congress), London (one month and Congress), Amsterdam (two weeks and Congress), Montpellier (Congress), Leipzig (one week and Congress), Erfurt (German Democratic Republic) one week and Congress, Paris (one week and Congress), Bratislava (many times), Szeged (many times), Debrecen (many times), Vienna (many times and EPOS Congress), Stolzalpe (three times, in period of one – two weeks), Berlin (many times), Hubertusburg (Wermsdorf – many times), Siebenlehn (as Lecturer – many times), Rummelsberg (one month), Copenhagen (two weeks), Björred (Sweden – some days), Heinola / Finland (many times – every time – one month), Oulu (Congress), Milano (Italy – Congress), Lubjana (short stay), Hong Kong (2004 – one week stay and Symposium), Beijing (2005 – one week stay and Congress), Helsinki (2005 – lecturer at Orthopedic Summer School / Place: Invalid Foundation Hospital / Helsinki / Teholantie 10).

He was awarded by the Rector (main Director of University) of Medical University of Lublin 39 times for scientific and educational work. He received three times award from the Ministry of Health of Poland (1975, 1986, 1993). He was also awarded with medals: "*Przyjaciel Dziecka*" (1978r.), "*Medal*

Pamiątkowy Sześćdziesięciolecia TPD" and „*Międzynarodowego Roku Dziecka*" (1979r.), *Złotą Odznakę TWK* (1984r.), *Złoty Krzyż Zasługi* (1987r.), Medal *im. dr Henryka Jordana* (2000r.) and Krzyż Kawalerski *Polonia Restituta* (2000r.) and Medal *Komisji Edukacji Narodowej* (2003r.), *medal Vincentego Pola* (2010). Since **1996** he is Honorary Member of Hungarian and since **2003** of Slovak Orthopedic and Traumatology Association and since **2005** of Czech Orthopedic and Traumatology Association. In 2006 he was awarded by Honorary Membership of The Society for Connective Tissues, Czech Medical Association, J.E. Purkynje, in 2008 by a Medal of honour of the Czech Medical Association J.E. Purkynje and in 2009 by a Medal for Clinical and Scientific Merits of The Society for Connective Tissues, Czech Medical Association, J.E. Purkynje.

In 2003 he was awarded by International Biographical Center Cambridge, England as Outstanding Intellectual of the 21th Century. Since 2005 his name is putting on list in The Contemporary Who's Who of Professionals ABI (USA).

He described the biomechanical etiopathogenesis of the so-called idiopathic scoliosis (1995–2007) and he is the author of a new rehabilitation treatment of this spine deformity. In the year 1997 he found that all children with scoliosis has the habit to stand 'at ease' only on the right leg and it was deciding for development of "C" 2nd/A scoliosis and "S" 2nd/B group of scoliosis and additional cause of development of "S" I group of scoliosis. In 2001 he described two etiopathological groups (1st and 2nd) and in 2004 the 3rd group of the development of so-called idiopathic scoliosis which proved to be crucial for prophylactics and new conservative treatment. In 2006 he described the "model of hips movement" – deciding in "development of every types of scoliosis". In 2007 he found the answer – why the blind children do not have scoliosis and in this year he also described the "indirect influences coming from CNS in small children and their influence for development of scoliosis in future".

He published these clinical findings in numerous polish and foreign publications and also in four books on scoliosis (2000, 2002, 2003 and 2011). His articles have been published also by International Research Society or Spinal Deformities – IRSSD Meetings in Athens (2002), in Ghent (2006) and in Liverpool (2008) and in Poznań (2012) – together 5 articles. He presented his ideas about etiology of scoliosis during SICOT Congress in Egypt (2002), in Cuba (2004), in Turkey (2005), in Marrakech (2007) and in Prague (2011).

In years 2012–2014 he attended many Symposia and Congresses IRSSD – in Liverpool, SOSORT – in Wiesbaden, in Hungary, in Czech Republic, in Germany, in Belgium, in England, in Greece, in Egypt. The recent information about so-called idiopathic scoliosis he published in many articles: in 2005, in 2007 and in 2010 in Pan Arab Journal of Orthopedics and Trauma and in 2011 in Spain and in US-China Orthopedic Journal (USA). In the time 2009–2019 he published many articles – mostly about etiology, about new classification and new therapy of the so-called idiopathic scoliosis in 44 articles in USA, Canada, Spain, Czech Republic. All these paper are presented in website www.ortopedia.karski.lublin.pl in point 17.

His scientific interest is first of all pediatric orthopedic surgery and specially:

1. DDH – etiopathogenesis, new functional treatment at newborn, babies and small children; new concept of femur osteotomy and innominate bone osteotomy of dysplasia hips – here many successes in treatment,
2. congenital feet deformities (club foot) – modification of skin incision,

3. *torticollis* – effective early new conservative treatment of new-born and small babies (described in Orthopädische Praxis in Germany and in American Research Journal of Medicine and Surgery),
4. *Morbus* Blount – explanation of etiology and operative procedures and since 33 years effective conservative treatment children in age of 1.5 – 3 years (described in Orthopädische Praxis in Germany and in Pohybove Ustroji – Locomotors System Journal in Czech Republic and in many articles in USA),
5. *genua valga* – new operative procedure – "lateral high realize". The fasciotomy of tractus ilio – tibilis – it was described in Locomotors System Journal edited in Czech Republic,
6. cerebral palsy (CP) – concept of new treatment through the RAO method [R - rehabilitation, A – apparatus, O – operation (if needed)]. It was described in the Locomotors System Journal edited in Czech Republic
7. coxarthrosis (arthrosis in hips) – adults patients, new concept for rehabilitation, new prevention's methods. This preventive method was presented in many Meetings in many countries. Two articles are published in USA. The paper about "Syndrome of Standing 'at ease' on the Right Leg" – presented rules of prophylaxis of the coxarthrosis is publish in Locomotors System in Czech Republic.
8. gonarthrosis (arthrosis in knees) – adults patients, new rehabilitation, new prevention, preventive surgery (simple surgery) – fasciotomy of tracts ilio-tibialis
9. hallux valgus and other foot insufficiency – adults patients, new rehabilitation, new prevention. Importance of" *toes flexion test"* (described in Beitrage zur Orthopädie / GDR).
10. back pain – adults patients, new rehabilitation, new prevention and physiotherapy methods. Many articles about this problem were published in USA and two articles published in Neurologia Praktyczna in Poland.

He is author of 7 original orthopedic devices (apparatus).

Publications in medical literature: Author of 6 monographs, author or co-author of 453 papers + 11 manuscripts after 2009 (plenty in English and in German). In 2011 he published a monograph about aetiology of the so called idiopathic scoliosis and about new treatment and causal prophylaxis of this spine deformity (4th Edition).

Foreign languages: German (full active), English (full active), Italian (passive/active), French (passive/active), Russian (passive/active).

Last ten years: in 2009 (30th September / 1st October 2009) he become the status "Professor Emeritus" (retirement) in Medical University. In these years (till now) he is working as Professor Lecturer in Vincent Pol University / Lublin / Poland, on Faculty of Physiotherapy. All years he is active and took place in many Congresses and Symposia in Poland and aboard (Orthopaedic Congresses in Hungary, in Germany, in SOSORT, SICOT, Prague-Lublin-Sydney-St. Petersburg Symposia. Since 2009 till 2018 he was Orthopaedic Surgeon Consultant in Military Hospital in Lublin.

In 2013 he had the series of lectures for German Students in April (one week) in University in Dresden and in December (one week) in University in Idstein / north of Frankfurt / Main (in program of ERASMUS). Others ERASMUS lectures were in Belgium, Italy, Spain in the years 2015–2019.

Dear Tomasz,

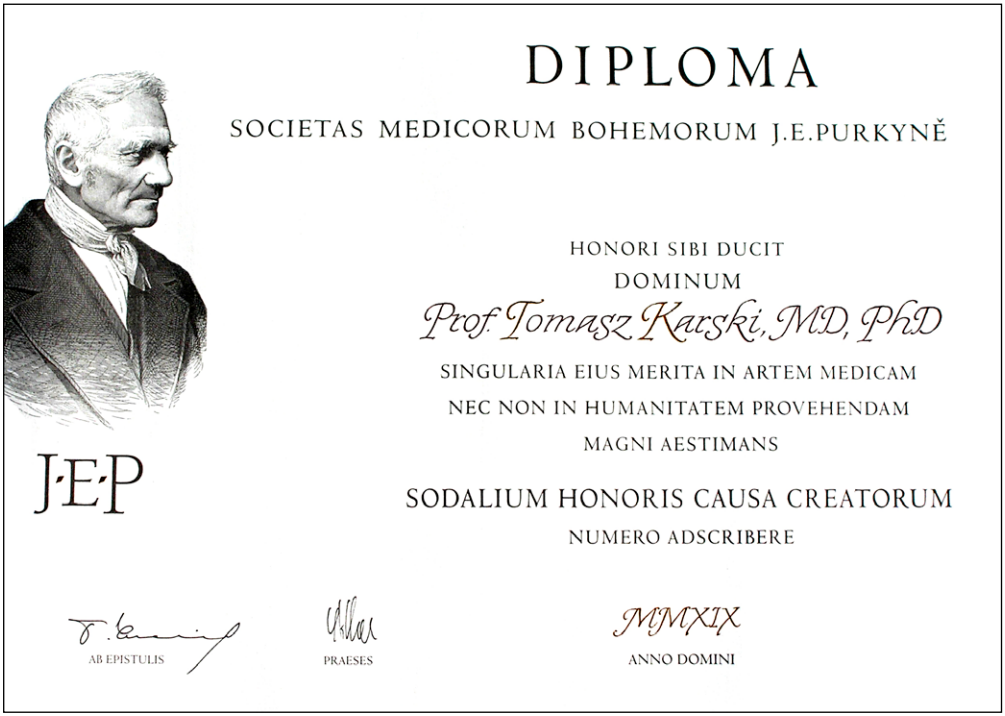
The committee of the Czech Medical Association J. E. Purkyně granted you the Honorary membership for your lifelong scientific work and care for paediatric orthopaedic patients. The award will be handed you by the president of the Czech Medical Association J. E. Purkyně Professor Štěpán Svačina, MD, DSc

Allow us all to wish you good health and subsequent success during your professional work and university activities.

Sincerely Yours

Ivo

Professor Ivo Marik, MD, PhD
President of The Society for Connective Tissues, CMA J.E. Purkynje
Research Secretary of The Society for Prosthetics and Orthotics CMA J.E. Purkynje



Prof. Mikhail Dudin, MD, PhD, DSc – septuagenarian

This year, one of the active participants in the symposium, Professor Dudin, is celebrating his 70th birthday. Over 47 years of his professional life, he has traveled a long and thorny path in orthopedics. Let me briefly mention the main stages of this glorious journey.

Mikhail Dudin was born on the 21st of October, 1949.

In **1972** – graduated with honors from the Leningrad Pediatric Medical Institute (now St. Petersburg).

1972–1974 – specialization (residency) in pediatric orthopedics and traumatology at the Turner Leningrad Research Children's Orthopedic Institute for obtaining the status of an orthopedic specialist.

1974–1984 – Internship at the clinic of the Leningrad rehabilitation center for children's orthopedics and traumatology "OGONEK".

In **1982** he defended his thesis on the topic "Idiopathic scoliosis with atypical pathological rotation of the vertebra: diagnosis, course, treatment tactics", which describes a special type of scoliosis with a benign course.

1984–1986 – Consultant, orthopedic surgeon, specialist in pediatric orthopedics and traumatology at the hospital Lenin in the city of Holguin, Republic of Cuba.

After 16 years of work as an orthopedic surgeon, after gaining experience and thinking about the results of this activity, a natural conclusion was made: most of the many treated patients could have avoided surgery! However, this required three conditions: the first is knowledge of the etiology and pathogenesis of the disease (in pediatric orthopedics, this information remains a big "white spot"!). The second is a reliable early diagnosis and prediction of the outcome of the lesions of the dorsal musculoskeletal system (in most cases the solution to this problem is determined by the subjective experience of an individual doctor and rarely has an objective basis). The third is the available medical technology for controlling the functional state of all parts of the musculoskeletal system (bones and connective tissues, as well as the neuromuscular complex).

The absence of these conditions completely determines the real position of the children's orthopedist – wait for the appearance of indications for surgical intervention. And during this wait, all classes were reduced to kinesitherapy and massage, which are often combined with the term "rehabilitation". On the basis of this idea, a new concept of pediatric orthopedics was developed – it must be conservative. It should be emphasized that we are talking about conservative orthopedics, and not about rehabilitation. By the way, the term rehabilitation literally means restoration of lost health and it expresses the main task of all medical specialties – from classical therapy to modern HiTech surgery. Therefore, for children's orthopedics it is more correct to use the term "habilitation". To achieve its goal it was necessary to solve a number of scientific problems. That is why in 1986–1996 Mikhail Dudin returned to the Leningrad Turner Research Institute for Children in the status of a researcher. According to the results of the in-depth analysis of the world scientific literature on osteogenesis, two control systems, the nervous and endocrine, were put in the spotlight.

The initial period of studying these systems in children with orthopedic pathology coincided with the work of M. Dudin in the Russian region affected by the disaster at the Chernobyl nuclear power plant – he was appointed head of the orthopedic section of the state program "Children of Chernobyl" (1989–1996). This appointment was "random." But in the end, invaluable experience was gained in studying the two main control systems in children in a population and at an environmental disaster.

The main question posed to the research group was: "How does the musculoskeletal system of the child population of the region responds to factors related to a nuclear catastrophe?" It was assumed that the main damaging factor is ionizing radiation from radioactive contamination. However, as a result, an unexpected conclusion was made: interference with the metabolic processes in the bone tissue of unstable iodine isotopes (I^{129} - I^{131}) and an excess of stable I^{127}, widely used as a protector of the thyroid gland, had the greatest impact. This new experience and purposeful study of the osteotropic hormone profile (growth hormone, cortisol, calcitonin, parathyrin) in children with the most common and striking mysterious skeletal disorder, idiopathic scoliosis, made it possible to see the pathogenetic role of these hormones. In addition, the data obtained show the material basis of the most indisputable fact in the theory and practice of scoliosis – the direct dependence of the development of pathological three-plane spinal deformity on the child's growth process.

In **1993**, Dr. M. Dudin defended his doctoral thesis on "Features of the hormonal regulation of bone metabolism as an etiopathogenetic factor for idiopathic scoliosis." His key messages were presented at the SICOT / SIROT World Congress in Amsterdam in 1996 and in 1999 at the GICD congress (congress chairman – Jean F. Dubousset) at which the author was presented with the First Prize for "new developments in the diagnosis and treatment of AIS in children and adolescents".

To implement the obtained scientific conclusions, M. Dudin transferred to work at the St. Petersburg rehabilitation center for pediatric orthopedics and traumatology "OGONEK", which he headed from 1996 to 2017 as director. At the same time, from 1997 – Professor of the Department of Pediatric Orthopedics and Traumatology, St. Petersburg Institute of Postgraduate Education. In 2001 he was awarded the title of professor.

In **2005** M.G. Dudin received the honorary title "Honored Doctor of Russia", and in 2009 he won the A.N. Kosygin Prize (for technology and innovation in pediatric orthopedics).

Professor M. Dudin is the author of 4 monographs on idiopathic scoliosis. They cover a wide range of issues – from diagnosis and pathogenesis to prevention and conservative treatment. In addition to these monographs, the professor has written 4 textbooks for students and doctors. Under his leadership, were defended 15 master's and doctoral theses in the field of developing ideas of conservative orthopedics. He was a free organizer of the 15th Prague-Lublin-Sydney Symposium in St. Petersburg (St. Petersburg, Russia, September 15–22, 2013). For this, M. Dudin was awarded the Diploma of the Honorary member of the Society for Connective Tissues, Czech Medical Association J.E. Purkynje and the Honorary medal of the Czech Medical Association J.E. Purkynje. Now Professor M.G. Dudin, already as a center consultant, continues his scientific and practical activity and its main goal is to transfer experience to young doctors.

Dear Mikhail

We all high value your knowledge and experience in paediatric orthopaedics, we appreciate your reseach particularly of adolescent idiopathic scoliosis and results of comprehensive treatment of this grave illness.

President Professor Štěpán Svačina, DSc and the Committee of the Czech Medical Association (CMA) J.E. Purkyně granted you a Diploma of Honorary Membership for your professional work, longtime international cooperation and support of The 15th to 21st Prague-Lublin-Sydney-St. Petersburg Symposium.

We sincerely wish you good health and many success in scientific, practical and university activities.

Sincerely Yours

Ivo

Professor Ivo Marik, MD, PhD
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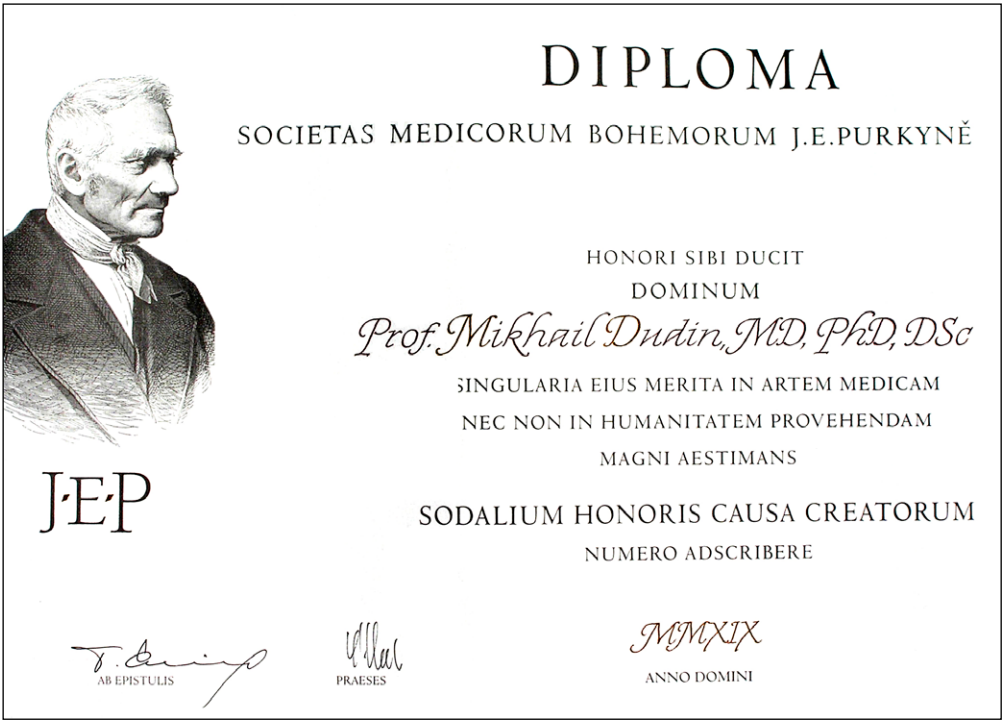
Research Secretary of The Society for Prosthetics and Orthotics CMA J.E. Purkynje



Assoc. Professor Petr Korbelář, PhD – septuagenarian

It is unbelievable how fast the time passes, and that our dear colleague reached the age, which was described in the last century as a respectable one. Together with Petr Korbelář, we spent a flourishing period of the Orthopaedic Clinic of the University Hospital in Prague – Motol under the leadership of Professor MUDr. Stanislav Popelka, DSc. (in the old building on Charles Square, where is now located part of the workplace of the Ministry of Labor and Social Affairs) and Professor MUDr. Rudolf Kubát, DSc.

Jubilant was born on June 6th, 1949, in Prague, into a medical family. His father and uncle were doctors.

Here are the milestones of the professional growth of the jubilant:

1967–1973 studied at the 3rd Medical Faculty of Charles University in Prague,
graduated on June 28th, 1973

1978 – 1st degree from surgery

1980 – 1st degree in orthopaedic surgery and traumatology

1985 – 2nd degree in orthopaedic surgery and traumatology

1986 – defended his dissertation thesis: "Experimental implantation of hydrogel in bone!"

1990 – appointed Associate Professor of orthopaedic surgery and traumatology

After taking a rigorous of anatomy in 1970, he worked as an auxiliary scientific force, later as an assistant at the Department of Anatomy, led by Professor Radomír Čihák, DSc., where he published his first scientific papers in 1970–1976. He obtained surgical erudition at the First Surgical Clinic of the Faculty of Medicine (1974-1976) and at the Surgical Department of the Regional Hospital in České Budějovice (Professor Antonín Kostelecký 1976–1977).

Since January 1, 1978, he is joining the 2nd Orthopaedic Clinic of Paediatric Faculty Charles University and Teaching Hospital Motol in Prague, where he currently works part time. He worked under the leadership of Professor MUDr. Stanislav Popelka, DSc., Professor MUDr. Rudolf Kubát, DSc. (as his deputy in 1983–1991), Assoc. Professor MUDr. Václav Smetana and at present under the leadership of Professor MUDr. Tomáš Trč, Ph.D.

He contributed to the preservation of the workplace at Charles Square and the development of the new clinic in Motol. He focused on spondylosurgery and spinal deformities in children and adults. After gaining experience and training with Professors MUDr. Otto Vlach, DSc. in Brno, and later on in many foreign workplaces (Germany, Austria, England, Russia). He developed conservative and surgical treatment of spinal deformities and injuries at the Orthopaedic Clinic of the University Teaching Hospital in Motol.

Throughout his orthopaedic career, he has also focused on the education of paediatricians and general paediatricians in spondylology. In 2004, he actively participated in regional seminars of continuous education of general practitioners for children (topic "Spinal deformities – diagnostics and treatment), organized by the Society of General Practitioners for Paediatric Physicians of the Czech Medical Association (CMA) J.E. Purkyně in cooperation with the Centre for Defects of Locomotor Apparatus in Prague.

While working in Bad Wildungen (Germany), he trained other colleagues in spondylosurgery, as Eng. Pavel Černý in brace treatment. He supported the activities of the Foundation for Children with Congenital Locomotor Defects in Kostelec nad Černými Lesy.

He has lectured at numerous domestic and foreign congresses (Germany, Austria, Poland, Switzerland, Holland, England and others), has published 100 scientific papers, 17 of them in abroad. In 1989–1991 he worked at the German Center for the Treatment of Scoliosis in Bad Wildungen under the leadership of Dr. Zielke and Dr. Metz, where he worked with a number of major European spondylosurgeons of today (Dr. Jezsensky, Prof. Halm, Doc. Beele, Dr. Meier).

He is a member of SICOT, AAOS, Czech Orthopaedic Society and several professional societies of the Czech Medical Society J.E: Purkyně. In 1994, he was a co-founder and member of the editorial board of the peer-reviewed journal Locomotor System – Advances in Research, Diagnosis and Therapy, published by the Society for Connective Tissues of CMA J.E. Purkyně. He is a member of the Committee of the Orthopaedic-Prosthetic Society of CMA J.E. Purkyně.

Since 1987 he has worked as a professional consultant with foreign pharmaceutical companies (Luitpold, Zimmer). Since 1991 he has been working also in the private sector. He founded with his partners companies dealing with import and distribution of pharmaceutical products (BMS, Luitpold, IBSA, Daichia-Sankyo, Haras, Gerlicher, Orthomol, Optima, Wolff) and medical devices (Surgicraft, Axialif, Apatech, Biotissue, X-stop, Ergoactives etc). In addition, he also works in a private non-state medical facility in Prague 2.

He still participates in part-time clinical work at the Clinic of Paediatric and Adult Orthopaedics at the University Teaching Hospital in Motol, where he is focused primarily on conservative and operative treatment of spinal deformities. In spite of his lifelong full working load he finds a while for his hobbies – golf, travelling and veteran cars.

Dear Petr,

to the next years of your life, we sincerely wish you first of all good health, continuing living optimism, successful private enterprise, many satisfied patients, subjective satisfaction in circle of your large family and friends and let your admirable workforce engagement holds on for a long time.

Festina lente!

Professor Ivo Mařík, MD, Ph.D.
president and committee members of The Society for Connective Tissues, CMA J.E. Purkyně

and

Petr Krawczyk, MD
president and committee members of The Orthopaedic-Prosthetic Society CMA J.E. Purkyně

Docent MUDr. Petr. Korbelář, CSc. – sedmdesátiletý

Je neuvěřitelné, jak hodiny času rychle ubíhají a že se náš milý kolega dožil věku, který v minulém století byl označován jako úctyhodný. S Petrem Korbelářem jsme společně prožili dobu rozkvětu dětské ortopedické kliniky FN v Motole pod vedením pana prof. MUDr. Stanislava Popelky, DrSc. (ještě v budově na Karlově náměstí, kde je nyní umístěna část pracoviště Ministerstva práce a sociálních věcí) a pana prof. MUDr. Rudolfa Kubáta, DrSc.

Jubilant se narodil 6. 6. 1949 v Praze v lékařské rodině. Jeho otec a strýc byli lékaři, jeho sestra, bratranci a sestřenice dodnes působí jako lékaři nebo zdravotníci.

Dále heslovitě uvádíme milníky odborného růstu jubilanta:

1967–1973 studium na 3. LF UK v Praze, promoce 28. 6. 1973

1978 – atestace I. st. z chirurgie

1980 – atestace I. st z ortopedie a traumatologie

1985 – atestace II. st z ortopedie a traumatologie

1986 – obhájil kandidátskou disertační práci: „Experimentální implantace hydrogelu do kosti!", řešil úkoly plánu základního výzkumu „použití esterů kyseliny methakrylové v kostní chirurgii.

1990 – jmenován docentem pro obor ortopedie a traumatologie

Po složení rigorosa z anatomie v r. 1970 pracoval jako pomocná vědecká sila, později jako asistent na anatomickém ústavu FVL pod vedením prof. MUDr. Radomíra Čiháka, DrSc., kde publikoval první vědecké práce v letech 1970–1976. Chirurgickou erudici získal na I. chirurgické klinice FVL (1974–1976) a na chirurgickém oddělení krajské nemocnice v Českých Budějovicích (prof. MUDr. Antonín Kostelecký,1976–1977).

1. 1. 1978 nastoupil na II. ortopedickou kliniku FDL UK a FN Motol, kde pracuje na částečný úvazek dosud. Pracoval pod vedení prof. MUDr. Stanislava Popelky, Prof. MUDr. Rudolfa Kubáta (jako jeho zástupce LPP v letech 1983–1991), doc. MUDr. Václava Smetany a nyní pracuje pod vedením Prof. MUDr. Tomáše Trče, CSc.

Zasloužil se o zachování pracoviště na Karlově náměstí a o rozvoj kliniky v Motole. Věnoval se především problematice spondylochirurgie a deformit páteře dětí i dospělých. Po získání zkušeností a vyškolení u Prof. MUDr. Otto Vlacha, CSc. v Brně a později na četných zahraničních pracovištích (Německo, Rakousko, Anglie, Rusko) rozvinul konservativní i operační léčení deformit a úrazů

páteře na ortopedické klinice FN v Motole. Řadu let zajišťoval výuku ortopedie a traumatologie pro mediky 2. LF UK v Motole. Po celou dobu své ortopedické kariéry se věnoval i vzdělávání dětských lékařů a praktických dětských lékařů ve spondylologii. V roce 2004 se aktivně zapojil do krajských seminářů kontinuálního vzdělávání Praktických dětských lékařů (téma „Deformity páteře – diagnostika a léčení), který byl pořádán Odbornou společností praktických dětských lékařů ČLS JEP ve spolupráci s Ambulantním centrem pro vady pohybového aparátu v Praze.

Při svém působení v Bad Wildungenu (SRN) zajistil vyškolení dalších kolegů ve spondylochirugii, Ing. Pavla Černého v korzetoterapii. Podporoval činnost Nadace pro děti s vrozenými vadami v Kostelci n. Č. l.

Přednášel na četných domácích i zahraničních kongresech (NSR, Rakousko, Polsko, Švýcarsko, Holandsko, Anglie a další). Publikoval více než 100 vědeckých prací, z toho 17 v zahraničí. Absolvoval studijní pobyty v Rakousku, Německu, Anglii, USA. V letech 1989-1991 pracoval na Německém centru pro léčení skolios v Bad Wildungen pod vedení Dr. Zielkeho a Dr. Metze kde spolupracoval s celou řadou dnes významných evropských spondylochirurgů (Dr. Jezsensky, prof. Dr. Halm, doc. Dr. Beele, Dr. Meier).

Je členem SICOT, AAOS, České ortopedické společnosti a několika odborných společností České lékařské společnosti J.E. Purkyně.

V roce 1994 byl spoluzakladatelem a je členem redakční rady odborného recenzovaného časopisu Pohybové ústrojí – pokroky ve výzkumu, diagnostice a terapii. Ve stejném roce byl jedním ze zakladatelů Ortopedicko-protetické společnosti ČLS JEP. V současné době své zkušenosti uplatňuje ve funkci člena výboru této společnosti. Zúčastňuje se sympozií „Kubátovy dny" a mezinárodního „Praha-Lublin-Sydney-St. Petersburg symposia", které jsou každoročně pořádány Společností pro pojivové tkáně ČLS J.E. Purkyně, z.s. a Ortopedicko-protetickou společností ČLS J.E. Purkyně, z.s.

Od roku 1987 spolupracoval jako odborný konzultant se zahraničními farmaceutickými firmami (Luitpold, Zimmer). Od r. 1991 pracuje v soukromé sféře, Založil se společníky několik firem věnujících se dovozu a distribuci farmaceutických přípravků (BMS, Luitpold, IBSA, Daichii-Sankyo, Haras, Gerlicher, Orthomol, Optima, Wolff) a prostředků zdravotnické techniky (Surgicraft, Axialif, Apatech, Biotissue, X-stop, Ergoactives). Kromě toho pracuje i v soukromém nestátním zdravotnickém zařízení na Praze 2.

Stále se účastní klinické práce na částečný úvazek na klinice dětské a dospělé ortopedie FN v Motole, kde se věnuje především konservativnímu a operativnímu léčení deformit páteře. I přes celoživotní vysoké pracovní vytížení si najde chvíle pro své záliby, a to golf, cestování a automobily veterány.

Milý Petře,

upřímně Ti přejeme do dalších let především pevné zdraví, trvající životní optimismus, úspěchy v podnikání, mnoho spokojených pacientů, osobní uspokojení v kruhu Tvé široké rodiny a přátel a ať Tvé obdivuhodné pracovní nasazení vydrží co nejdéle.

Festina lente!

prof. MUDr. Ivo Mařík, CSc.
předseda a členové výboru Společnosti pro pojivové tkáně ČLS J.E. Purkyně, z.s.

a

MUDr. Petr Krawczyk
předseda a členové výboru Ortopedicko-protetické společnosti ČLS J.E. Purkyně, z.s.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