



6th International Anthropological Congress of Dr. Ales Hrdlicka 150th anniversary of birth.

“All mankind is of one origin”

Features of endogenous neuropeptides in children with initial symptoms of AIS

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HUMPOLEC
2019





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Adolescent idiopathic scoliosis (AIS)



**Adolescent idiopathic
scoliosis (AIS)
is
a result of the medullo-
vertebral "conflict"**





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Neuropeptides (introduction)

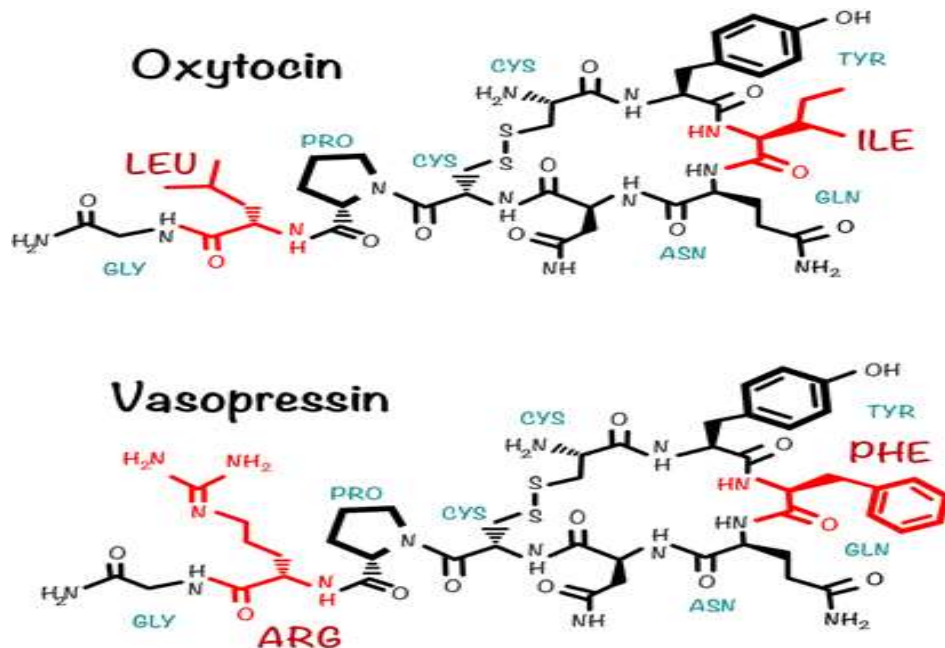
- **Neuropeptides are proteins formed in the nervous system. They act as regulators of many physiological functions of humans and animals. First one who named this proteins was de Vid (1969).**
- **Vartanyan's scientific group had been investigating functional condition of injured brain and discovered new characteristics of natural neuropeptides in the 70s of the twentieth century (Scientists Research Institute Exp. Medicine) (Certificate of Discovered in USSR, №365).**
- **They are female regulator of OXYTOCIN and regulator of water-salt balance of ARGININE-8-VASOPRESSIN.**



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Neuropeptides (introduction)



Vartanyan G. A. (1930-1995)
Physiologist. Doctor of medical Sciences,
Professor. Corresponding member of the
USSR Academy of medical Sciences,
corresponding member of RAMS



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Neuropeptides (introduction)

- Apart from the fact that neuropeptides are same at different species they also increase the sensitivity of spinal motor neurons to efferent impulses. Moreover, each of them gives such effect only to one side. Therefore, they were called postural asymmetry factors (PAFs)
- They are present in biological fluids (liquor, blood serum, urine and others)



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Purpose of research

A asymmetric paravertebral muscle activity was discovered by instrumental investigation in 40-50 years of last century. And it is quite reasonable to consider that PAFs effects on the asymmetric paravertebral muscle activity.

Aim: to study the role of PAFs (OXYTOCIN and ARGININE-8-VASOPRESSIN) in the pathogenesis of AIS.



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Materials and methods

Stage 1.

- At this stage, there was a search for an answer to the question: do PAF (neuropeptides) participate in the pathogenesis of AIS?
- There was used BIOTESTING method.
- The object of study was the blood serum of 156 patients with AIS and 30 healthy children at a same age group.



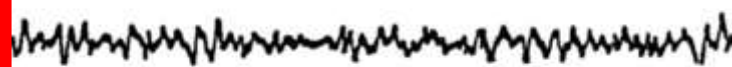
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The Method of biotesting



EMG-gram of the muscles of the lower limbs of the recipient with the crossed spinal cord



EMG-gram of the muscles of the lower extremities of the recipient with a crossed spinal cord after injection of blood serum from a donor with scoliosis.

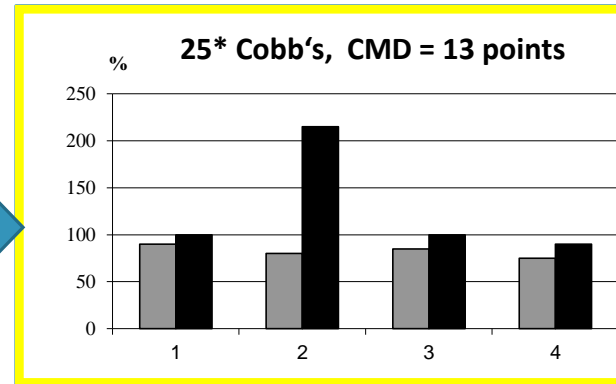
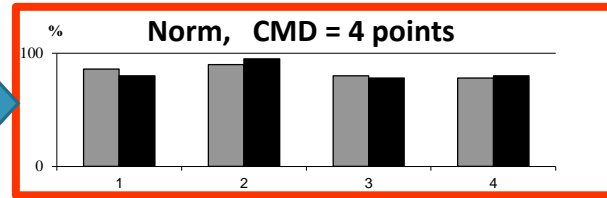




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A method of biotesting (results)





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Materials and methods

Stage 2

- At this stage, to determine the quantitative characteristics of OXYTOCIN and ARGININE-8-VASOPRESSIN in children with AIS technique was used ELISA
- The object of study was blood serum of children aged 6 - 12 years with initial manifestations of AIS (100 patients) and their healthy peers (22 people)
- This group was chosen because the period of transition healthy vertebral column to scoliotic is low studied.



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Materials

THE SERUM OF 122 CHILDREN

Healthy children
(n = 22)

Children with AIS 8-15° Cobb's (n = 74)

- Right-side (n = 32)

- Left-side (n = 25)

- S-shaped (n = 17)

Children with violation of posture
like "flat back",
(n = 26)



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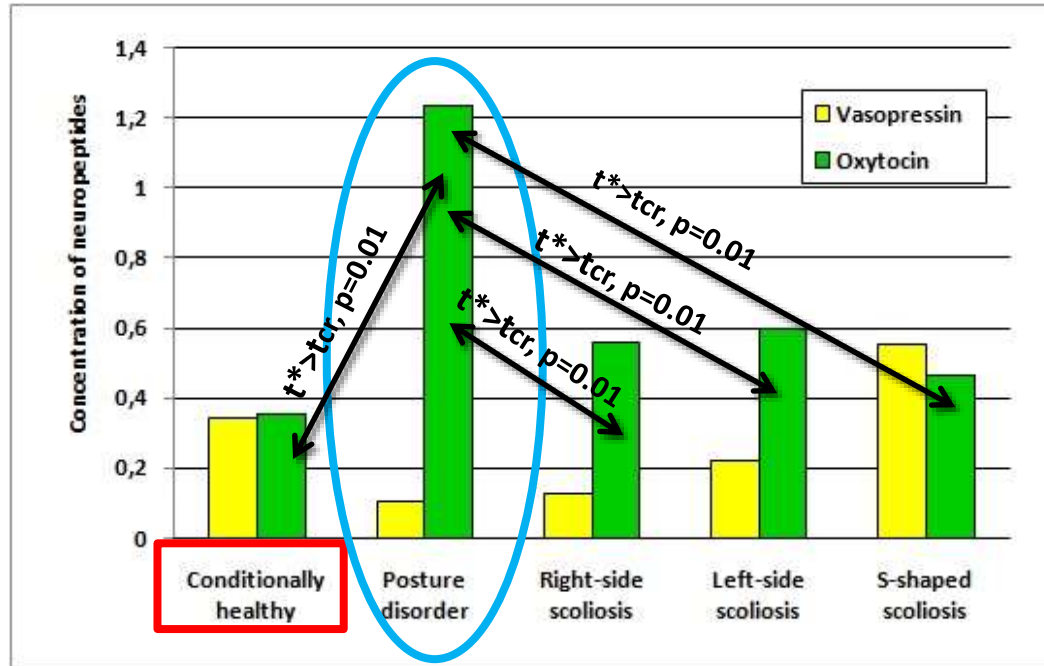


Methods

1. Verification diagnosis was carried out by complex clinical and instrumental examination of patients
2. Enzyme-Linked-Immuno-Sorbent Assay (ELISA) of venous blood samples: the venous blood was taken into vacuum tubes containing protease-Aprotinin inhibitorin. The procedure was done in the morning on an empty patient stomach. Commercial kits were used for the study in full accordance with the manufacturer's instructions ([Peninsula Laboratories, LLC № S-1355, № S-1357](#))
3. Statistical analysis of the data (a method of assessing the significance of differences in average values)



Results



The average measure of endogenous neuropeptides (oxytocin and arginine-8-vasopressin) in blood serum of different children groups



Results

- 1) There is significant difference of high concentration of oxytocin in children with “FLAT BACK” syndrome in comparison with healthy peers
- 2) There is no linear relationship between the level of oxytocin and 3D-deformation of the spinal column
- 3) The ratio between the concentration of oxytocin and arginine-8-vasopressin was most informative for:

1. conditionally healthy 1:1

2. violation of posture like “flat back” 10:1

3. scoliosis - Right-side 6:1

- Left-side 2:1

- S-shaped 1:1



Conclusion

1. The studied neuropeptides OXYTOCIN and ARGININE-8-VASOPRESSIN are participants in the pathogenesis of AIS and from our point of view their role is particularly important during the syndrome of "flat back" then the a healthy spinal column transforms to the scoliotic
2. OXYTOCIN is the most sensitive PAF, which is also a female hormone regulator, which may explain the prevalence of AIS in girls (girls:boys - 4:1)
3. We consider it is reasonable to study neuropeptides further to find out methods of influence on their level. Such methods may become absolutely new in conservative treatment of AIS.



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THANK YOU FOR YOUR ATTENTION



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