

# Modern problems of rheumatic diseases in children

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## ABSTRACT

Rheumatic diseases is a potentially debilitating autoimmune disease that affects approximately three percent of the population. The aim of the present study was to detect the correlation between cerebrovascular complications and noradrenergic-serotonergic regulation disbalance in children during rheumatic diseases. The following changes were found in children with rheumatic disease and cerebral circulation disturbances: the increase of glutamate and aspartate, decrease of GABA, increase of catecholamines and serotonin in the blood. The ratio excitatory/inhibitory mediatory amino acids increased significantly. Disturbances of amino acids and biogenic aminoacids metabolism leads to the neurological complications of rheumatic diseases in children.

**KEYWORDS:** *rheumatic disease, dopplerography, serotonin*

**R**heumatoid disease is a potentially debilitating autoimmune disease that affects approximately three percent of the population. Most patients with rheumatic diseases have a progressive disability. There is also an increased mortality rate. There are two popular theories regarding the pathogenesis of Rheumatic disease. The first holds that the T cell, through interaction with an - as yet unidentified - antigen, is the primary cell responsible for initiating the disease as well as for driving the chronic inflammatory process. Some rheumatic sufferings occur during or after an infection which results in the immune system beginning to attack its own tissues, e.g. the articular cartilage. This is called an auto-immune reaction. The biochemical aspects of cerebral dysfunction syndrom of rheumatic diseases in children are uncertain.

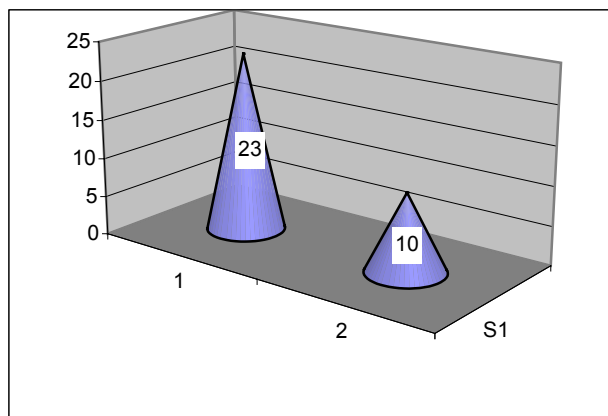
The aim of the present study was to detect the correlation between cerebrovascular complications and noradrenergic-serotonergic regulation disbalance in children during rheumatic diseases.

## MATERIAL AND METHODS

We have investigated 23 pediatric patients (12-14 years old)(basic group) with the rheumatic diseases. As for control group, it was made up by the 10 practically children (Fig.1). The groups have consisted of the randomly selected. All children admitted to the Center for Mothers and Children, Tbilisi, Georgia.

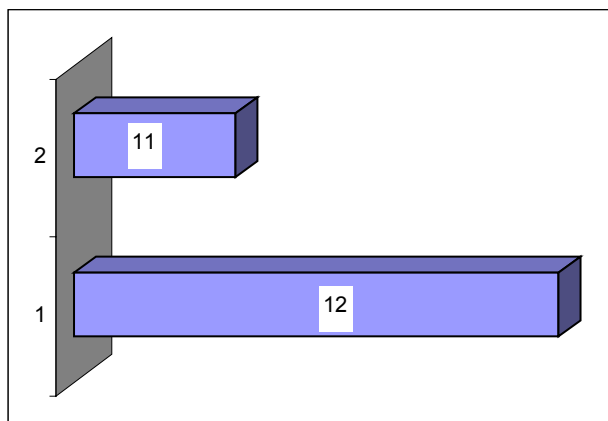
The patients profile was (Fig.2): male-12, female-11. All children were subjected to antibiotic and non-steroid anti-inflammatory course of treatment. Along with the above-mentioned investigated, by the method of fluorometry and Intra-cranial dopplerography. The level of biogenic amines and serotonin in blood were determined.

Intra-cranial dopplerography was performed using the apparatus – PIONEER COMPANIAN. phirm "nikolet" Gerny.



1. Basic group; 2. Control group

**Fig.1** Distribution of children in basic and control groups.



1. Female; 2. Male

**Fig.2** Patient profile.

| Indeces                  | Control group | Basic group |
|--------------------------|---------------|-------------|
| Norepinephrine (n.mol/l) | 624,0±36,0    | 457,0±23,0  |
| Epinephrine (n.mol/l)    | 313,0±33,0    | 414,0±37,0  |
| serotonin (n.mol/l)      | 0,95±0,11     | 1,06±0,008  |
| dopamine (n.mol/l)       | 508,0±25,0    | 313,3±32,6  |

**Tab.1** Linear speed of blood in control and basic groups.

Obtained data were analyzed statistically using the method of correlative analysis, with program *epinfo*

### RESULTS AND DISCUSSION

Have been detected, that during the primary rheumatism, complications are frequently presented by the chorea minor; Norepinephrine content is significantly reduced compared to the group of practically healthy children; Epinephrine concentration increases, resulting decrease in Norepinephrine/Epinephrine interrelations; Accumulation of dopamine in brain structure makes background for aggressiveness, chaotic movement, emotionality etc; Increased serotonin concentration and decreased

Norepinephrine/Epinephrine interrelations points on alterations towards serotonergic regulation.

The following changes were found in children with rheumatic disease and cerebral circulation disturbances: the increase of glutamate and aspartate, decrease of GABA, increase of catecholamines and serotonin in the blood.

The ratio excitatory/inhibitory mediatory amino acids increased significantly. Disturbances of amino acids and biogenic aminoacids metabolism leads to the neurological complications of rheumatic diseases in children.

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## Особенности современного течения ревматизма у детей

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### РЕЗЮМЕ

Целью работы являлось изучение взаимосвязи между цереброваскулярными осложнениями и норадренерго-серотонинергическим дисбалансом при первичном ревматизме у подростков методами интракраниальной доплерографии и флюорометрии. Обследовано 23 подростков (средний возраст 12-14 лет) с первичным ревматизмом, которые принимали антибиотики и нестероидные противовоспалительные препараты. Установлено, что при первичном ревматизме осложнения проявляются в виде малой хореи. Содержание норадреналина значительно ниже по сравнению с практически здоровыми детьми. Увеличивается содержание адреналина, что вызывает ослабление норадреналино-адреналиновых взаимосвязей. Аккумуляция дофамина в мозговой структуре создает условия для развития агрессивности, хаотических движений, эмоциональности и т.д. Повышенный уровень серотонина и ослабленные норадреналино-адреналиновые взаимосвязи указывают на сдвиги в серотонинергическом направлении.

**Ключевые слова:** *ревматические болезни, доплерография, серотонин*

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□ **International committee of medical journal editors. Uniform requirements for manuscripts submitted to biomedical journals.** *Ann Intern Med* 1997;126:36-47.

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*State the purpose of the article and summarize the rationale for the study or observation. Give only strictly pertinent references and do not include data or conclusions from the work being reported.*