

## TO THE QUESTION OF VEGETATIVE BACKGROUND IN CHILDREN WITH CHRONIC GASTRODUODENAL PATHOLOGY

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**Abstract.** It is proved that the vegetative dysfunction, which originated in childhood or adolescence, becomes an unfavorable background and a harbinger of many diseases, including chronic ones. In connection with the increase in the frequency of autonomic dysfunction in children, there is a need in recent years to study this problem.

**Objective.** To study the state of the autonomic nervous system in children with chronic gastroduodenal pathology.

**Materials and methods.** 120 school-age children were examined, who were hospitalized in the gastroenterological department of the city children's clinical hospital in Chernivtsi. Children are divided into two groups: the main one (60 people with chronic gastroduodenal pathology), and the control group (60 people with functional diseases of the gastrointestinal tract).

During the questioning of children, using the questionnaire of Wayne, the state of the vegetative nervous system was evaluated. To determine the nature of autonomic dysfunction with a predominance of sympathetic or parasympathetic departments, the vegetative Kerdo index was used. All children were also electrocardiographically examined.

**Results.** Children with chronic gastroduodenal pathology were twice as likely to have autonomic dysfunction as compared to the comparison group. Estimating the Curdo index in children from the main group, the prevalence of the sympathetic tone of the vegetative system was significantly higher ( $85.6 \pm 0.2\%$ , vs.  $50.8 \pm 0.3\%$  in the control group and significantly less pronounced in them eutonia -  $4.4 \pm 0.4\%$ , against  $41.0 \pm 0.2\%$  in the control group,  $p < 0.05$ ).

**Conclusions.** The predominance of the frequency of autonomic dysfunction in children of the main group can be explained by the effect of autonomic dysregulation and organic lesions of the gastroduodenal zone in them.

**Ключові слова:**  
діти, вегетативна  
нервова система,  
вегетативна  
дисфункція,  
гастроудоденальна  
патологія.

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## ДО ПИТАННЯ ВЕГЕТАТИВНОГО ФОНУ В ДІТЕЙ ІЗ ХРОНІЧНОЮ ГАСТРОДУОДЕНАЛЬНОЮ ПАТОЛОГІЄЮ

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Доведено, що вегетативна дисфункція, яка виникла в дитячому чи підлітковому віці, стає несприятливим фоном та передвісником багатьох захворювань, зокрема хронічних. У зв'язку зі зростанням частоти вегетативної дисфункції у дітей за останні роки виникає необхідність вивчати цю проблему.

**Мета роботи.** Дослідити стан вегетативної нервової системи в дітей із хронічною гастроудоденальною патологією.

**Матеріали та методи.** Обстежено 120 дітей шкільного віку, які перебували на стаціонарному лікуванні в гастроентерологічному відділенні міської дитячої клінічної лікарні м. Чернівці. Дітей розподілено на дві групи: основну - (60 осіб із хронічною гастроудоденальною патологією), та контрольну - (60 осіб із функціональними захворюваннями органів травного каналу).

Під час анкетування дітей за допомогою опитувальника Вейна оцінили стан вегетативної нервової системи. Для визначення характеру вегетативної дисфункції із переважанням симпатичного чи парасимпатичного відділів використовували вегетативний індекс Кердо. Усім дітям також проводили електрокардіографічне обстеження.

**Результати.** У дітей із хронічною гастроудоденальною патологією у двічі частіше виявляли вегетативну дисфункцію, ніж у групі порівняння. Оцінивши індекс Кердо у дітей із основної групи вірогідно частіше спостерігалось переважання симпатичного тону вегетативної системи  $85,6 \pm 0,2\%$ , проти  $50,8 \pm 0,3\%$  у контрольній групі та вірогідно рідше виявлено в них еутонію -  $4,4 \pm 0,4\%$ , проти  $41,0 \pm 0,2\%$  у контрольній групі,  $p < 0,05$ .

**Висновки.** Переважання частоти вегетативної дисфункції у дітей основної групи можна пояснити наслідком вегетативної дизрегуляції та органічного ураження гастроудоденальної ділянки у них.

## К ВОПРОСУ ВЕГЕТАТИВНОГО ФОНА У ДЕТЕЙ С ХРОНИЧЕСКОЙ ГАСТРОДУОДЕНАЛЬНОЙ ПАТОЛОГИЕЙ

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**Резюме.** Доказано, что вегетативная дисфункция, которая возникла в детском или подростковом возрасте, становится неблагоприятным фоном и предвестником многих заболеваний, в том числе хронических. В связи с ростом частоты вегетативной дисфункции у детей за последние годы возникает необходимость изучать эту проблему.

**Цель работы.** Исследовать состояние вегетативной нервной системы у детей с хронической гастродуоденальной патологией.

**Материалы и методы.** Обследовано 120 детей школьного возраста, которые находились на стационарном лечении в гастроэнтерологическом отделении городской детской клинической больницы г. Черновцы. Дети разделены на две группы: основную - (60 человек с хронической гастродуоденальной патологией), и контрольную - (60 человек с функциональными заболеваниями органов желудочно-кишечного тракта).

Во время анкетирования детей при помощи опросника Вейна оценили состояние вегетативной нервной системы. Для определения характера вегетативной дисфункции с преобладанием симпатического или парасимпатического отделов использовали вегетативный индекс Кердо. Всем детям также проводили электрокардиографическое обследование.

**Результаты.** У детей с хронической гастродуоденальной патологией в два раза чаще определяли вегетативную дисфункцию, чем в группе сравнения. Оценив индекс Кердо у детей из основной группы достоверно чаще наблюдалось преобладание симпатического тонуса вегетативной системы  $85,6 \pm 0,2\%$ , против  $50,8 \pm 0,3\%$  в контрольной группе и достоверно реже обнаружено в них еутонию -  $4,4 \pm 0,4\%$ , против  $41,0 \pm 0,2\%$  в контрольной группе,  $p < 0,05$ .

**Выводы.** Преобладание частоты вегетативной дисфункции у детей основной группы можно объяснить следствием вегетативной дисрегуляции и органического поражения гастродуоденальной зоны у них.

### Ключевые слова:

дети, вегетативная нервная система, вегетативная дисфункция, гастродуоденальная патология.

Клиническая и экспериментальная патология Т.16, №2 (60). С.44-48.

### Introduction

The autonomic nervous system - the part of the nervous system, which is regulating and supervising the work of all internal organs, which helps to maintain a balance of internal environment [1, 4]. It is proved that autonomic dysfunction (VD), which originated in childhood or adolescence, is an unfavorable background and a harbinger of many diseases [1, 5]. In particular, all chronic diseases are accompanied by disorders of the autonomic nervous system [4]. VD - is a disease characterized by complex of symptoms of disorders in psycho-emotional, sensory motor and autonomic activities associated with segmental and suprasedgmental impaired autonomic regulation of various organs and systems [1, 4, 7]. This enables an individual approach to the scheme of examination, treatment, and prevention of various diseases in children [5].

Recently, the incidence of VD is significantly increased, its course is accompanied by functional disorders of many organs and systems of a child's body [1, 4, 7]. According to data of Kiev city center of the autonomic dysfunction in children, the number of hospitalized patients with autonomic disorders within the recent years has increased by 3 times, and in the structure of childhood diseases, they make up 20% of all disease (VG Maidannyk, NM Kukhta 1992). It must be emphasized that as autonomic dysfunction syndrome occurs in 25-80% of patients with different pathologies [3, 6]. There is almost

no pathological condition which development would not be associated with disorders of the autonomic nervous system, while the VD as an independent disease mostly occurs only in childhood [2, 5, 6].

One of the features of the disorders of autonomic nervous system is that the occurrence of the first signs of VD may appear in the neonatal period (marbling of the skin, cyanosis of nasolabial triangle or limbs, violation of thermoregulation, spitting up, vomiting, intestinal cramps, arrhythmias or repolarization processes on the electrocardiogram) [4]. Clinical manifestations of this syndrome are active in the early preschool period and maximal - in adolescence. [2]. With age, such signs of VD can be seen in children: 1-3 years - constipation or diarrhea, 3-6 years - episodic vomiting, 6-12 years - abdominal pain and functional disorders of the gastrointestinal tract, 9-12 years - headache, 13-16 years - a headache, dizziness, cardialgia. In 17-20% of children, the VD is later transformed in psychosomatic diseases with age [1, 3, 6].

Therefore, we assessed the state of the autonomic nervous system in children with chronic gastroduodenal pathology.

### The aim of the study

To investigate the condition of the vegetative nervous system in children with chronic gastroduodenal pathology.

### Materials and methods

The study involved 120 children of school age who were hospitalized in the gastroenterology department of Chernivtsi Children's City Clinical Hospital. The average age of children was  $14,1 \pm 0,13$  years. Children were divided into two groups. The main group included children (60) with chronic gastroduodenal pathology, the control group (60) - children with functional diseases of the gastrointestinal tract.

We used the following methods of examination: anthropometric, clinical, laboratory, instrumental, statistics. The assessment of the state of the autonomic nervous system was carried out using a questionnaire of A.M. Wayne in which every point was assessed with a score from 0 to 7, depending on the nature of the symptom and its presence or absence. If the total score did not exceed 15 - the tone of the autonomic system was considered unimpaired, in case of exceeding 15 points - the autonomic dysfunction was observed.

To determine the nature of autonomic dysfunction (VD) with a predominance of sympathetic or parasympathetic divisions of the autonomic nervous system the Kerdo vegetative index (VI):  $VI = (1-D / HR) * 100$  where D - diastolic blood pressure, HR - heart rate for 1 minute was used. If the coefficient was positive - the predominant influence of the sympathetic division was observed, if the

digital coefficient had a minus sign - it proved the increased parasympathetic tone. Additionally, all children underwent the ECG examination. Mathematical data processing was carried out using the Microsoft Office programs Excel and Statistica 6.1.

### The results and their discussion

The main group included children with the following nosologies: chronic gastritis (12 children), chronic superficial gastroduodenitis (28 children), chronic erosive gastroduodenitis (13 children), chronic hyperplastic gastritis (7 children). Children in the control group had no organic pathology of the digestive system but had functional disorders: functional dyspepsia (29 children), functional disorders of the biliary tracts (21 children), irritable bowel syndrome (10 children).

After the assessment of the state of the autonomic nervous system with the help of Wayne Questionnaire in groups of children, the following results were received: (Fig.1).

Overall, in the majority of cases in the main group the manifestations of autonomic dysfunction were observed significantly more often, unlike the children in the control group.

To determine the prevalence of the sympathetic or pa-

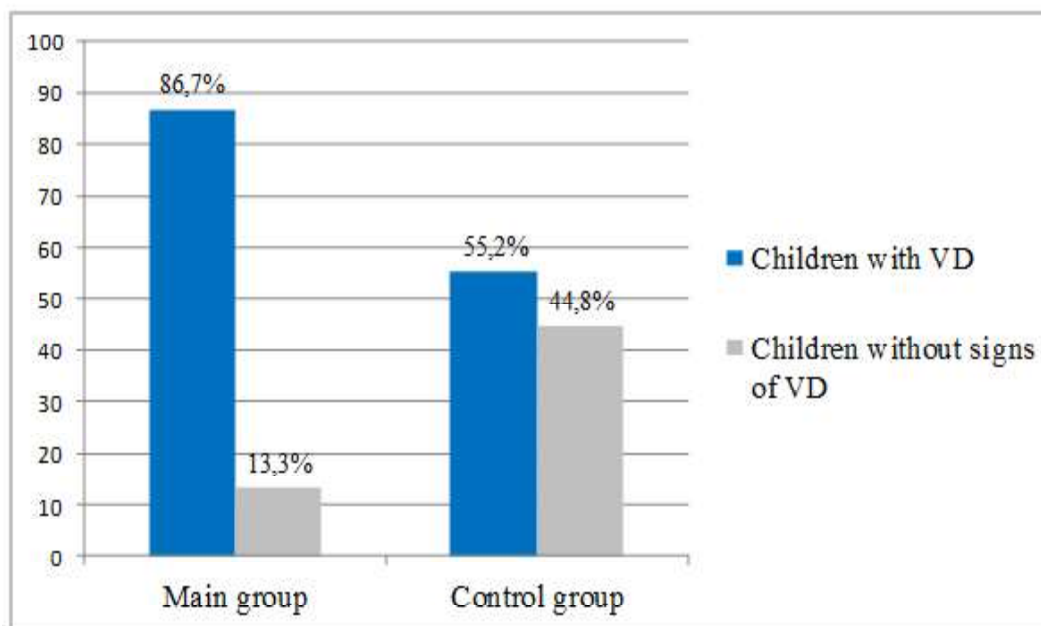


Fig. 1. The assessment of autonomic nervous system in children in comparison groups

rasympathetic parts of the autonomic nervous system the Kerdo's Vegetative Index (VI) was calculated for all examined children.

Thus, the majority of children in the main group showed the predominance of the sympathetic division of the autonomic nervous system and significantly less - eutony.

During the assessment of the ECG in the main group of children, the following changes were identified: tachycardia - 10%, bradycardia - 6.7% of children, metabolic abnormalities - 6.7%, various blockades - 3.3% and extrasystolia - in one case.

During the ECG evaluation, the following changes re-

vealed in children in the control group: tachycardia - 10% of cases, bradycardia - 5%, metabolic changes - 5%, various blockades - 3.3% and extrasystolia - in one case.

Thus, no crucial difference between the identified ECG changes in children of both groups was observed, indicating the presence of the same vegetative background.

The characteristics of sleep were evaluated in all children. The average sleep duration in children of the main group was  $8.6 \pm 0,05$  hours, minimum -  $7.4 \pm 0,05$  hours, maximum -  $10 \pm 0,05$  h. The average sleep duration in children in the control group was  $8.5 \pm 0,04$  hours, minimum -  $7,5 \pm 0,04$  hours, maximum -  $9 \pm 0,04$  h.

The restful night sleep was observed in 71.1% of

The assessment of the Kerdo's Vegetative Index in children

Groups	The number of children with the prevalence of sympathetic tone	The number of children with the prevalence of sympathetic tone	The number of children with the prevalence of eutonia
Main (n=60)	85,6±0,2 %*	10,0±0,3 %	4,4±0,4 %*
Control (n=60)	50,8±0,3 %	8,2±0,4 %	41,0±0,2 %

Note. \* -  $p < 0.05$  - significant difference between groups.

children in the main group, in 13.3% of children the sleep was restless.

In 45.9% of children in the control group, the night sleep was restful, in 16.4% of children a restless one was registered.

The correlation between the restless sleep in children and the bedtime -  $r = 0,35$  ( $p < 0.05$ ), between restless sleep and duration of sleep in children -  $r = 0,41$  ( $p < 0.05$ ) between restless sleep in children and the presence of VD -  $r = 0,71$  ( $p < 0.05$ ) and pain syndrome -  $r = 0,52$  ( $p < 0.05$ ) between night sleep and wake up time in the morning -  $r = 0,63$  ( $p < 0.05$ ) was observed.

Thus, the quality of sleep in children of the main group was worse than that in children of the control group.

### Conclusions

1. In the assessment of the autonomic nervous system in the main group of children, the autonomic dysfunction was found almost twice as likely as in the control group, which may be considered as one of the manifestations of the main disease.

2. After assessing of the Kerdo index it was registered the significantly more often the prevalence of sympathetic tone of the autonomic system  $85,6 \pm 0,2\%$  was observed in children of the main group, against  $50,8 \pm 0,3\%$  in the comparison group, and eutony was less frequent -  $4,4 \pm 0,4\%$ , against  $41,0 \pm 0,2\%$  in the comparison group,  $p < 0.05$ .

### The prospects for further research.

The further study of changes in the autonomic nervous system in children and adolescents with gastroduo-

denal pathology and the establishment of the role of autonomic dysfunction in pathogenetic mechanisms of these diseases is perspective.

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