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## Violations of the posture in children with pathology of digestive organs: Inter subject problem

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### ABSTRACT

In article characteristic of posture in 120 school-aged children with pathology of gastrointestinal organs was given. Among them: in 60 children signs of connective tissue dysplasia were estimated. In 60 patients acquired violations of posture were found. In clinic of combined pathology abdominal pain, nausea, as well as headache with dizziness was noticed. It was estimated that in children with peptic ulcer scoliosis of the II degree more often was seen. In patients with chronic gastroduodenitis and biliary dysfunction–scoliosis of the I degree was estimated.

**Keywords:** children, posture, dysplasia of connective tissue, digestive organs.

### 1. Introduction

Reality of modern life improves rapid increase of somatic and orthopedic pathology among school-aged children <sup>[1, 2, 3]</sup>.

Lack of physical activity and absence of life-style modification, school desk which is not adequate for needs of child's organism, as well as presence of congenital and inherited pathology of bones and muscles, frequently cause serious problems with posture and could be predictable for the development of diseases of the spinal column with risk for the other organs and systems <sup>[4, 5, 6]</sup>. Unfortunately, at the late stage to manage and cope with such problem would be too difficult, moreover if violations of the posture are associated with other somatic pathology, particularly of digestive organs.

**Objectives of the work.** To improve character of violations of the posture in children with diseases of digestive organs.

**2. Materials and methods of investigation.** 60 school-aged children with pathology of digestive organs with inherited and acquired violations of posture were examined. Among them: in 20 patients peptic ulcer was proved, in 20 – dysfunction of the gall-bladder, in 20 chronic gastroduodenitis were estimated. For evaluation of risk factors for development of posture problems acquiescing of anamnesis was obtained.

Diagnosis of somatic pathology was verified according to modern protocols of diagnostics and therapy (Order of Ministry of public health of Ukraine №59 from 29.01.13 y.). With purpose to verify violations of posture we've evaluated physiological curves of the spinal column in frontal and sagittal squares (neck and lumbar lordosis, chest and iliac kyphosis).

It is known that correct posture is characterized by equal level of forearms, angles of scapulas, equal length of neck-shoulder lines (distance between ears and shoulder joints), depth of triangles of waist (shallow hollow made by coulisse of waist and hand which was putted down in free style), straight vertical line of vertebrae in frontal square, equal lines and distances of the chest and lumbar area (in position of declination) <sup>[4, 5, 6]</sup>.

Also with purpose to confirm diagnosis we've made radiology of spinal column in two projections.

According to radiological degrees of scoliosis certain we've estimate: I – angle of declination from the spinal column is 0-10°, II – angle of declination from the spinal column is 11-25°, III – angle of declination from the spinal column is 25°.

Stoop is the violation of posture, at the basis of which increased kyphosis with parallel decreased lumbar lordosis.

Neck lordosis, as a rull, is shorter and deeper because of chest kyphosis and reaches the level of 4-5th cervical vertebrae.

Stoop more commonly accompanies wings-like scapulas of 1 and 2 degree; lower angles of

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scapulas are more far from chest. In stoop children back muscles, first of all upper fixates of the scapulas, big and small chest muscle, laxatives of the neck at the level of check lordosis are strained and shortened.

Length of laxative of the corpus in chest parts, at the level of lower and even middle fixatives of scapulas, buttock and muscles of the abdomen, at the contrary, is increased [4, 5, 6].

Round back (total kyphosis) belong to violation of posture, connected with neck kyphosis, extreme enlargement of degree for the neck and check kyphosis, and absence of lumbar lordosis. For compensation of declination in general axis of their body weight children with total kyphosis are standing and working with half-flexed extremities.

Angle of declination of the pelvis is smaller and it also improves declined establishment of the limbs due to middle line of the body. Head is declined forward, brachial joints are addicted, chest is compressed inside and hands are hanging forward body. Round back is more often connected with wings-like scapulas of the 2 degree. In children with round back upper fixatives of the scapulas, big and small chest muscles are strained and shortened. Length of laxative of the body, lower and middle fixatives of scapulas, buttock and abdominal muscles at the contrary is increased. Stomach in this case as in previous one comes forward [4, 5, 6].

Round-excavated back is a violation of posture which is connected with increasing of all physiological curves. Angle of pelvis declination is also increased. Anterior abdominal wall is over extended; stomach comes forward and even down. Brachial joints are addicted, head comes forward from middle line of the body. Round-excavated back is commonly connected with wings-like scapulas of 1-2 degree. In children with such violations of posture shortened upper fixators of scapulas, extensors of the neck, big and small chest muscles, extensors of the body in lumbar area and sacroiliac muscle. Length of extensor of the body in chest part, lower and sometimes middle fixators of the scapulas, muscles of abdomen, buttocks muscles too [1, 2, 3].

Flat back is a violation of the posture in which decreased physiological curves of the body are seen and first of all – lumbar lordosis with decreased angle of the pelvis. Because of decreased chest kyphosis chest comes forward as well as lower part of the stomach. Scapulas more often are like wings [1, 2, 3].

It has to be noticed, that these violations of posture more extremely decrease function of the spinal column, what results negatively on condition of central nervous system

during running, jumping and either sharp dislocations causing its commotion and local trauma [3, 4, 5]. In children with flat back muscles of the back, chest and abdomen are weak. They say that these children are in risk for side curves of the spinal column [4, 5].

Flat-excavated back is characterized by decreased chest kyphosis with normal or increased lumbar lordosis. Neck lordosis is also flatted. Angle of declination of the pelvis is increased and the pelvis itself is dislocated at the end. Lower extremities are slightly flexed or over-extended in knee-joints. Often it is combined with wings-like scapulas of the first degree. In children with such violation of posture, extensors of the body in lumbar and chest parts of the body and sacro-iliac muscles are shortened and strained. More significantly muscles of the abdomen and buttocks became weaker [4, 5].

Scoliotic posture (curved spinal column in frontal square) is characterized by asymmetric localization between right and left parts of the body, different height of forearms due to spinal column and due to chest.

Depth and height of triangles of the waist in such children is also different [4, 5, 6]. Muscles at one half of the body are more expressed then at the other. Linea of spinous processes forms the arc with direction of apex to the right or to the left. Rising up the hands, declination of the corpus forward or doing of other methods of self correction linea of spinous processes in frontal square of the spinal column becomes straight [6].

Statistic data was done according to STATISTICA BASIC program. We have determined approved level of validity (p). Validity for general degree of connection non-parametric criterion of Pierson was used ( $\chi^2$ ).

**3. Results of investigation and its discussion**

From anamnesis of examined children with acquired violations of posture it was known that in majority cases pathological changes have appeared at 3-6<sup>th</sup> year of studies, at the result of irregular decoration of seats (65,0%), anomalies of refraction (myopia, astigmatism ) – 20,0 % cases, carrying of the bags at one shoulder (15,0%).

In majority patients of both groups (70,0%) pathology of pregnancy was found (excess or small amount of amniotic fluid, somatic pathology in mother), as well as delivery (chronic hypoxia of the fetus, twisting of umbilical cord) – in 25,0% cases accordingly.

**Table 1:** Phenotypical sings of dysplasia of connective tissues in children with pathology of digestive organs, n=60

Sign	Amount of patients (absolute number/%)
Flat feet (pes planus)	18 (30,0%)
Scoliosis	45 (75,0%)
Kyphosis	30 (50,0%)
Juvenile osteochondrosis	15 (25,0%)
Joints hypermobility	14 (23,3%)
Deviated nasal septum	3 (5,0%)
Anomalies of bite	4 (6,7%)
Myopia	5 (8,3%)
Asthenic statura	6 (10,0%)
Prolapsed mitral valve of the II degree with regurgitation (++)	30 (50,0%)
Additional cords in heart chambers	40 (66,7%)
Deformities of the gall-bladder	50 (83,3%)

Duration of pathology of digestive organs up to the moment of admitting to the hospital was for  $3,5 \pm 2,0$  years. Hereditary anamnesis was complicated in children with peptic ulcer, thus dysfunctions of biliary tract were found more seldom ( $50,0\% \text{ i } 5,0\%$ ,  $p < 0,05$ ).

In anamnesis of children with phenotypical pathology of connective tissue dysplasia pathology of pregnancy took place, particularly threat of interruption of pregnancy and fetal-placental insufficiency ( $25,0\%$  and  $10,0\%$ ,  $p < 0,05$ ).

We have found violations of posture related to presence in children phenotypes (phens) of dysplasia of connective tissue. Received results were are represented below.

As we can see from data listed above, in mostly cases among

violations of posture in children with pathology of digestive organs and signs of dysplasia of connective tissues rather scoliosis no kyphosis took place ( $\chi^2=12,80$ ,  $p < 0,05$ ). Between anomalies of connective tissue in children with combined pathology deformations of the gall-bladder took place more often then additional cords in heart chambers ( $\chi^2=10,40$ ,  $p < 0,05$ ). Symptoms of juvenile osteochondrosis and flat feet were observed with equal frequency in representatives of all groups ( $\chi^2=0,627$ ,  $p > 0,05$ ).

Frequency of the symptoms of main somatic pathology in patients with different pathology of digestive organs and acquired violations of posture is shown at figure 1

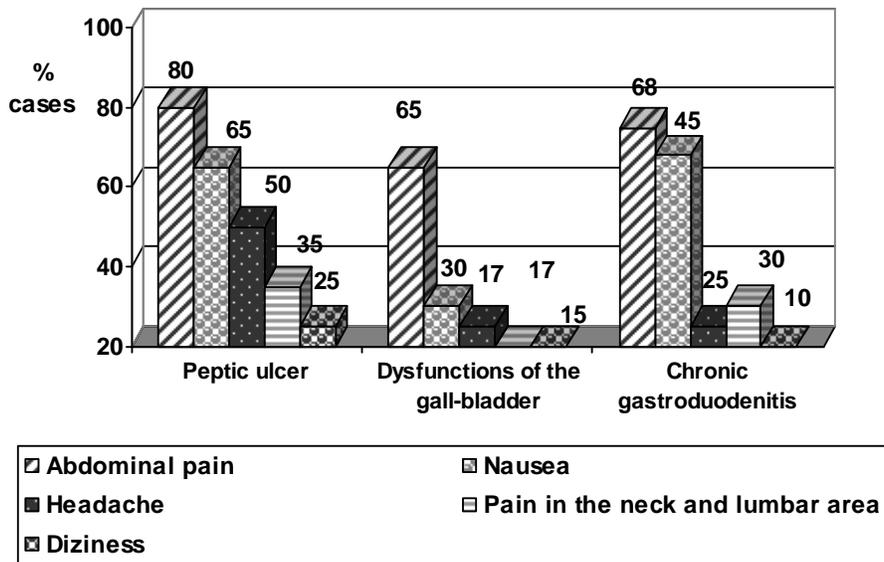


Fig 1: Frequency of clinical symptoms in children with diseases of digestive organs with acquired violations of posture, n=60

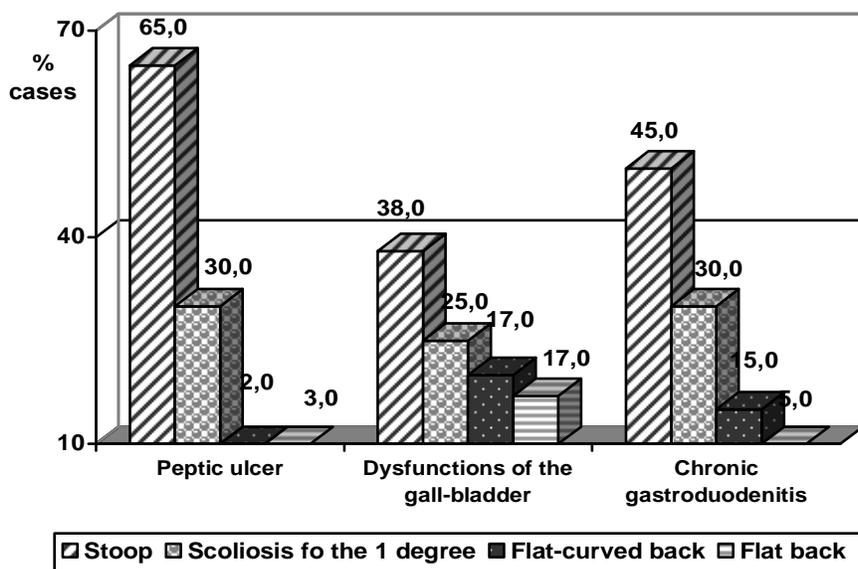


Fig 2: Acquired violations of posture in children with pathology of digestive organs, n=60

Analysis of received data reveals non-specific clinical symptoms in variable pathology of digestive organs at the basis of acquired violations of the posture.

Particularly, in clinic of peptic ulcer and dysfunctions of the gall-bladder more often abdominal pain without exact seasonable characteristics was seen (80,0% and 65,0%,  $p < 0,05$ ). More seldom nausea was estimated (65,0 i 30,0%,  $p < 0,05$ ), as well as headache (50,0% i 17,0%,  $p < 0,05$ ).

In clinic of chronic gastroduodenitis sings of abdominal pain syndrome with localization in pyloroduodenal area (68,0%), more seldom – nausea (45,0%) were found. Headache in this group of the patients was noticed more often then dizziness (30,0% and 10,0%,  $p < 0,05$ ).

During inspection of the children with pathology of digestive organs the following violations of the posture were found (figure 2).

As it is shown from figure above in diseases of digestive organs stoop and scoliosis of 1 to 2 degrees were examined. Particularly, more expressed changes in peptic ulcer and chronic gastroduodenitis were seen ( $\chi^2=8,080$ ,  $p < 0,05$ ). Data was approved by radiological data. Scoliosis of the I degree more often was seen in children with chronic gastroduodenitis and biliary dysfunction ( $\chi^2=6,283$ ,  $p < 0,05$ ).

**4. Conclusions.** Violations of the posture is an actual problem of pediatrics, particularly at the basis of chronic diseases of chronic diseases of upper gastroduodenal tract. Stoop and scoliosis of the 2 degree more often were mentioned in peptic ulcer, thus scoliosis of the 1<sup>st</sup> degree was seen in chronic gastroduodenitis and biliary dysfunction.

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