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ЖУРНАЛ ГЕПАТО-ГАСТРОЭНТЕРОЛОГИЧЕСКИХ ИССЛЕДОВАНИЙ

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CHANGES OBSERVED IN THE ACTIVITIES OF THE HEPATOBILIARY SYSTEM IN CHILDREN WITH METABOLIC SYNDROME

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ABSTRACT

Changes in the hepatobiliary system are often found in children with obesity and metabolic syndrome. Metabolic syndrome and obesity are pathologies in children that negatively affect all organs and systems, including the state of the hepatobiliary system. Recently, many studies have been conducted to study the effect of obesity on the state of the hepatobiliary system, which is associated with an increase in the incidence of non-alcoholic fatty liver disease in children with increased body weight and obesity. Insulin resistance is affected not only by the normalization of metabolic disorders, but also by the treatment of liver and biliary tract pathology.

Keywords: obesity, children, hepatobiliary system.

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МЕТАБОЛИК СИНДРОМ БОР БЎЛГАН БОЛАЛАРДА ГЕПАТОБИЛИАР ТИЗИМ ФАОЛИЯТИДА КУЗАТИЛАДИГАН ЎЗГАРИШЛАР

АННОТАЦИЯ

Семизлиги бўлган болаларда метаболик синдромда гепатобилиар тизимда ўзгаришлар кўп учрайди. Метаболик синдром ва семизлик болаларда барча орган ва тизимларда, шу жумладан, гепатобилиар тизим ҳолатига ҳам салбий таъсир кўрсатадиган патология ҳисобланади. Кейинги пайтларда семизликни гепатобилиар тизим ҳолатига таъсирини ўрганишга қаратилган кўплаб тадқиқотлар ўтказилган, бу тана массаси юқори бўлган ва семизлиги бўлган болаларда жигарнинг алкоголсиз ёғли гепатозини учраш частотасини ошиши билан боғлиқ. Инсулинорезистентликка нафақат метаболик бузилишларни нормаллашуви, балки, жигар ва ўт йўлларини патологиясини даволаш ҳам таъсир кўрсатади.

Калит сўзлар: семизлик, болалар, гепатобилиар тизим.

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ИЗМЕНЕНИЯ, НАБЛЮДАЕМЫЕ В ДЕЯТЕЛЬНОСТИ ГЕПАТОБИЛИАРНОЙ СИСТЕМЫ У ДЕТЕЙ С МЕТАБОЛИЧЕСКИМ СИНДРОМОМ

АННОТАЦИЯ

Изменения в гепатобилиарной системе часто встречаются у детей с ожирением и метаболическим синдромом. Метаболический синдром и ожирение — патологии у детей, которые негативно влияют на все органы и системы, в том числе и на состояние гепатобилиарной системы. В последнее время проводится много исследований по изучению влияния ожирения на состояние гепатобилиарной системы, что связано с ростом частоты неалкогольной жировой болезни печени у детей с повышенной массой тела и ожирением. На инсулинорезистентность влияет не только нормализация метаболических нарушений, но и лечение патологии печени и желчевыводящих путей.

Ключевые слова: ожирение, дети, гепатобилиарная система.

Metabolic syndrome (insulin resistance syndrome) is a symptom complex of various metabolic disorders and conditions associated with obesity, the development of which is characterized by a single pathogenetic mechanism, which has attracted the attention of representatives of various medical fields in recent years. Despite the achievements in understanding the mechanism of its development, metabolic syndrome is one of the most controversial issues in modern medicine [1,2]. In this regard, the symptom complex begins to form in childhood and remains asymptomatic for a long time, metabolic syndrome is an urgent pediatric problem [3, 4]. Currently, the following

conclusions have been proven, according to which the digestive system plays a key role in the pathogenesis of metabolic and hormonal disorders, in which they themselves become target organs, their functional state deteriorates with the development of metabolic syndrome [5, 6, 7, 8]. It has been established that any component of the metabolic syndrome leads to secondary disorders in the form of non-alcoholic fatty liver disease in adults, while the views on this pathological process differ: some authors consider hepatic steatosis to be a "harmless condition" that does not affect the state of hepatocytes to a certain extent and resolves after the etiological factor is eliminated [9]. Other authors believe that liver damage is an important factor in the development of metabolic syndrome, and that with the development of non-alcoholic fatty liver disease, bile formation and bile secretory dysfunction are observed, which is manifested in the state of the biliary system [10]. Among children, there is information that non-alcoholic fatty liver disease occurs in 68% of obese children, and in 84% of children with metabolic syndrome [11]. Biliary tract pathology is more common in adult patients with impaired carbohydrate and lipid metabolism [12, 13].

The **aim of** this study was to study the state of the hepatobiliary system in children with metabolic syndrome.

Materials and methods:286 children aged 10 to 16 years were examined: the main group consisted of 236 children (125 boys, 18 girls) with signs of metabolic syndrome (IDF, 2007), [14], the comparison group consisted of 50 children with normal body weight (32 boys, 18 girls), who were being treated in a hospital for diseases of the hepatobiliary system (biliary tract dysfunction, gallstone disease). The examinations were based on clinical, laboratory and instrumental methods of examination and included the determination of renal enzymes, the spectrum of carbohydrates and lipids in the blood serum, the determination of the contractile function of the gallbladder, as well as UTT, computed tomography of the hepatobiliary system. Statistical analysis of the results was carried out using the "STATISTIKA 6.0" package. The reliability of the difference in quantitative characteristics was calculated using the Student t-test and the Mann-Whitney test. The chi-square test was used to analyze the statistical significance of the difference in qualitative characteristics. When comparing the difference indicators, the indicator $p < 0.05$ was considered reliable.

Results of the examination and their analysis

Based on the criteria of UTT (increased echogenicity and diffuse unevenness of the organ parenchyma, turbidity of the vascular image, refraction of ultrasound rays), non-alcoholic fatty liver disease was observed mainly in children of the main group (166-70.0%). Computed tomography of 13 patients with non-alcoholic fatty liver disease showed that the liver parenchyma was uneven, the densitometric density of the unchanged area was from 55 to 60 units. N., the local density of individual foci was from 15 to 43 units. N., and during local examination, contours were not detected in all areas. When checking the pulse sequence using SPAIR, a low signal was observed in hypodense areas. At all stages of contrast enhancement, including simultaneous scanning, there were minimal changes in the parenchyma, the density of which did not change. At all stages of contrast enhancement, there was no significant difference in the areas of the parenchyma, the density of which did not change.

It was found that the average values of alanine aminotransferase, bilirubin, gamm aglutamyl transpeptidase were higher in children in the main group than in the comparison group, which indicates a violation of the process of bile formation and excretion.

It should be noted that 65 (27.4%) children from the main group had an increase in ALT, of which 31 (13.1%) had an increase of 2 or more times, which indicates the development of an inflammatory process in the liver parenchyma of the type of non-alcoholic steatohepatitis.

It was observed that half of the children in both groups had various developmental anomalies of the biliary tract.

In 114 (48.1%) children in the main group and in 9 (18.0%) of the comparison group, structural changes in the wall of the gallbladder were detected ($r<0.05$). It was found that all children in the main group had a decrease in the contractile activity of the gallbladder, in the comparison group, hypomotor type of contraction was observed in 27 (54%) patients, hypermotor type in 4 (8%) children, normal in 19 (38%) children.

In the main group, 71 (29.9%) children and 6 (12.0%) children in the comparison group, signs of gallbladder cholestasis (the combination of 2 or more signs: increased wall density, uneven wall, thickening of the wall, increased density of bile in the gallbladder, a decrease in the bile ejection fraction by 50%) were observed on CT scan [8] ($p < 0.05$), in all groups these changes were of a diffuse nature (up to 99%). Cholestasis of the gallbladder, with intact lithogenic effect, was observed only in 4 (5.6%) of the 71 patients in the main group, while in all the others, cholelithiasis of various stages was observed.

In general, 87 (36.7%) children in the main group and 18 (36.0%) children in the comparison group (children with gallstone disease were examined) had impaired lithogenic effect of bile composition, accompanied by the formation of bile sediment and gallstones of various etiologies. At the same time, gallstone disease was more common in children in the comparison group - 6 out of 87 (7.0%) in the main group and 14 out of 18 (77.7%) in the comparison group ($p < 0.05$), biliary sediment was observed in 81 out of 87 (93.1%) in the main group and 4 out of 18 (22.3%) in the comparison group ($p < 0.05$). No significant differences were observed in the presence of one or more gallstones in the study group: in the main group, these figures were 2 (33.3%) and 4 (66.7%), in the comparison group - 6 (42.9%) and 8 (57.1%) (Fig. 2–4). The effect of impaired lithogenic effect of gallstones on waist circumference was analyzed. It was found that in children, the waist circumference in patients with biliary sludge was 108.8 ± 12.25 cm on average, which was significantly higher than in children with gallstones (94.5 ± 6.35 cm) ($p < 0.05$) and in children with unchanged bile colloid composition (100.75 ± 11.88 cm) ($p < 0.05$), which indicates that children with abdominal obesity are at increased risk of developing gallstones.

It was found that children with nonalcoholic fatty liver disease had gallstone disease of different stages in more cases than children without hepatosis (76 of 166 children (45.7%) and 11 of 71 children (15.5%) $r < 0.05$), 72 of 76 children (94.7%) and 9 of 71 children (81.8%) biliary deposition was detected. Symptoms of gallbladder cholestasis were more common in these patients (38.6% in 64 of 166 children and 9.9% in 7 of 71, $r < 0.05$).

Conclusion

70.0% of children with metabolic syndrome have signs of non-alcoholic fatty liver disease, in which structural changes in the liver parenchyma are characterized by diffuse focal changes, with foci of fatty degeneration of various sizes and the development of steatohepatitis against the background of unchanged parenchyma.

In children with metabolic syndrome, it was observed that the levels of cytolytic enzymes and cholestasis markers were higher than in children with normal body weight, which indicates a sharp violation of the process of bile formation and excretion. In every third child with metabolic syndrome (27.4%), an increase in ALT was observed, which indicates the development of non-alcoholic steatohepatitis in them.

In children with metabolic syndrome, severe disorders of the functional state of the associated biliary tract are formed, in which, along with the physicochemical composition of bile, its motor-evacuator activity is also impaired.

Every third child with metabolic syndrome (36.7%) has disorders of the colloid composition of bile, which manifests itself in the form of gallstone disease with a predominance of the stage of gallstone formation.

Every third child with metabolic syndrome (29.9%) has signs of a diffuse form of gallbladder cholestasis, which is accompanied by gallstone disease at various stages.

A correlation was found between the lithogenic composition of bile and waist circumference, which indicates that children with abdominal obesity may be predisposed to the development of cholelithiasis and require timely preventive measures.

Список литературы/ Iqtiboslar / References

1. Uchamprina V. A., Romantsova T. I., Kalashnikova M. F. Metabolic syndrome: the arguments «for» and «against» // Obesity and metabolism. — 2012 . — No. 2 . — P. 17–24.

2. Vikulova O. K. Controversies and consensuses of the metabolic syndrome. According to the materials of the IV International Congress «Prediabetes and metabolic syndrome», 6–9 April 2011, Madrid // Diabetes. — 2011. — No. 2. — P. 127–130.

3. Bokova T. A. Metabolic syndrome in children: features of formation and clinical course, approaches to diagnosis, prevention and treatment. Author. dis. doctor. med. sciences. Moscow, 2014. — 48 p.

4. Leontyeva I. V. Diagnosis and treatment of metabolic syndrome in pediatric practice // Doctor. Ru. — 2011. — No. 2. — P. 13–23.

5. Sinitsin A. P., Shcherbakova M. Y., Larionova V. I. Metabolic syndrome in children and adolescents. Clinico-genetic Parallels. — LAP LAMBERT Academic Publishing, 2011. — 153 p.

6. Nelson R. A., Bremer A. A. Insulin resistance and meta- bolic syndrome in the pediatric population // Metab. Syndr. Relat. Disord. — 2010. — Vol. 8. — No. 1. — R. 1–14.

7. El-Koofy, N. M. The Association of Metabolic Syndrome, Insulin Resistance and Non-alcoholic Fatty Liver Disease in Overweight Obese Children // Saudi J. Gastroenterol. — 2012. — Vol.18. — No. 1. — P. 44–49.

8. Lazebnik L. B., Zvenigorodskaya L. A. Metabolic syndrome and digestive organs. — M.: Anarchic, 2009. — 184 p.

9. Pavlovskaya E. V., Strokova T. V., Kaganov V. S. Metabolic syndrome in children and adolescents. Opinion of a gastroenterologist // Questions of children's dietology. — 2012. — Vol. 10. — No. 5. — P. 50–56.

10. Burt A. D., Mullon A., Day C. P. Diagnosis and interpretation of steatosis and steatohepatitis // Seminars in Diagnostic Pathology. — 1998. — No. 15. — P. 246–258.

11. Stephen A. Harisson. Increased activity of hepatic enzymes and fatty liver // Clinical gastroenterology and hepatology. — 2009. — T. 2. — No. 3. — P. 26–31.

12. Fu J. F. Shi H. B., Liu L. R. et al. Non-alcoholic fatty liver disease: An early mediator predicting metabolic syndrome in obese children? // World J. Gastroenterol. — 2011. — Vol. 14. — № 17 (6). — R. 735–742.

13. Zvenigorodskaya L. A., Ovsyannikov O. N., Khome- riki S. G. Cholesterosis of the gall bladder and atherogenic dyslipidemia: etiology, pathogenesis, clinical manifestations, diagnosis, treatment // Effective pharmacotherapy. — 2012. — No. 2. — P. 8–13.

14. Grigorieva N. I. Cholelithiasis: another component of metabolic syndrome? // Medical advice. 2012. — No. 9. — S. 92–93.

15. Zimmet P., Alberti G., Kaufman et al. The metabolic syndrome in children and adolescents — an IDF consensus report // Pediatric Deabetes. — 2007. — Vol. 8. — № 5. — P. 299–306.