



MODERN ASPECTS OF METABOLIC SYNDROME IN CHILDREN

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Annotation. In recent years, there has been a clear trend of steady growth and spread of metabolic syndrome (MS) among the population of developed countries, including in Uzbekistan [3,20]. Thus, according to multicenter international studies, the spread of MS among the adult population varies from 10 to 40% [2,16], forming the main causes of mortality in the adult population. Thus, according to WHO (2006), in the proportion of 10 main risk factors for overall mortality, the three leading places are occupied by the components of the metabolic syndrome: arterial hypertension, high blood cholesterol, high body mass index. The whole importance of the problem lies in the fact that more and more often we have to deal with this problem in children and adolescents, because it is in childhood that the origins of the metabolic syndrome are recorded later in adults. [12,13,14]. Thus, the prevalence of MS in childhood varies according to different authors from 4% to 28.7% in the general population and is significantly higher among obese children and adolescents [5,6,7,8]. Despite the difference in methodological approaches, clinical and epidemiological studies indicate a steady increase in the prevalence of MS among adolescents and young people [9,10,11], which was confirmed by long-term studies in US adolescents, which showed an increase in the incidence of MS over the past 10 years from 4.2% to 6.4% in the population. For the first time the term "metabolic syndrome" was introduced by Reaven G.M. (1988) [15,16] who combined under this name the syndrome of insulin resistance (IR), arterial hypertension (AH), dyslipidemia, type 2 diabetes mellitus, and obesity. This served as a further comprehensive study of it in the adult population, and for a long time, this problem has become relevant for pediatricians. Numerous discussions held by pediatricians in recent years prove the priority of one or another symptom as the leading symptom of MS in children and adolescents. One of the serious trends has been the consideration of obesity, namely its visceral-abdominal form, as a key syndrome-forming component of MS. The choice of obesity as one of the reasons for the development of MS is not accidental. This modern world trend is based on significant factors. The first group of factors includes numerous data proving a significant, often key role of obesity in the formation of both individual signs that make up MS and the syndrome itself. So it is known that up to 90% of patients with DM2, which is the main, "large" component of MS, are obese [6,7,10,1]. About 40% of obese patients suffer from hypertension, which is no less significant marker of MS [13].

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Approximately 60% of obese patients have MS [6.13]. Another significant factor is the progressive, widespread growth of obesity, which, as mentioned above, is not only considered the main diagnostic criterion for MS but also contributes to the formation and accelerates the development of the main components of MS, thereby increasing the likelihood of early onset of cardiovascular and other diseases. (5, 14). Thus, according to WHO, up to 40% of the adult population is overweight, and up to 25% are obese, and every year these figures are only growing. Among children and adolescents, these figures are about 15%; Almost one in 10 children is obese. The leading role of obesity, namely its abdominal form, in the diagnosis is confirmed by the fact that the most authoritative and currently in-demand principles for diagnosing MS (IDF, 2005,2007; the draft recommendation of the VNOK on the diagnosis and treatment of MS.2009) consider precisely the criterion of abdominal obesity as the main one, refusing the mandatory laboratory confirmation of IR. Viscero-abdominal obesity is diagnosed at 10-18 years of age in terms of waist circumference (WC) > 90th percentile for a given age and gender. Other authors (9,18) propose to consider obesity as abdominal if the WC/OB index (hip volume) in girls is >0.85 and in boys >0.9, as well as the results of other auxiliary diagnostic methods, for example, the detection of epicardial fat by echocardiography [18,19]. A number of other researchers consider IR to be the main and obligatory link in MS - a violation of the action of insulin on the target tissue, leading to a decrease in insulin-dependent glucose utilization, primarily in the muscles and liver. [4,9.10.17]. Research by Kozlova L.V. et al. (2009) [9] showed that IR can be recorded in the absence of abdominal obesity in children and adolescents since the waist circumference is an indirect criterion for visceral obesity (the direct method is the determination of visceral fat by computed tomography). The presence of IR during epidemiological studies can be indirectly judged by the ratio of fasting glucose and insulin levels. This ratio is taken into account in the model of glucose homeostasis ((Homeostasis Model Assessment) equal to HOMA $R = G \circ -FNS$ 22.5; where Go is the concentration of fasting blood glucose (mmol / l); INSo fasting serum insulin concentration (µU/ml). In the presence of reliable clinical and paraclinical criteria for MS, this study should not be routine, since it is quite difficult to perform and expensive. Nevertheless, the HOMA-R index makes it possible to calculate an indicator that characterizes the function of [3-cells] from the concentrations of basal insulin and glucose. An index value above 2.77 indicates insulin resistance [4,17,18]. There are numerous studies devoted to the study of the subtle mechanisms of the influence of IR and compensatory hyperinsulinemia on the level of blood pressure and the cardiovascular system as a whole [9.12]. Normally, insulin has a vascular protective effect due to the activation of fofatidyl-3-kinase in

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endothelial cells and microvessels, which leads to the expression of the endothelial NO synthetase gene, the release of NO by endothelial cells, and insulin-mediated vasodilation. Violation of these processes leads to the development and progression of hypertension, which is one of the main components of MS, which tends to increase everywhere. So the data of the world literature give fluctuations in arterial hypertension among children and adolescents from 0.8 to 33% [1,2,16]. Controversial in the diagnosis of MS is the presence of its small signs, such as microalbuminuria and left ventricular myocardial hypertrophy. The study of these signs is especially relevant, since in childhood and adolescence such target organs as the kidneys and myocardium are especially vulnerable under the influence of metabolic disorders [11]. Additional criteria for MS also include triglyceride levels >1.3 mmol/L. high-density lipid cholesterol < 1.03 mmol/l in boys and 5.2 mmol/l, impaired fasting glycemia (5.5-6.1 mmol/l), impaired glucose tolerance (glucose level 7.8-11.1 mmol/l 2 hours after the load), hyperuremia (serum uric acid level is more than 310 µmol/l in children and adolescents 8-15 years old and more than 310 µmol/l in people 15-18 years old. There is an active discussion to determine the place and role of hyperuremia (HU) within the development of MS [9,11,18,19,20]. At this stage, the problem is not only the question of the priority of MS or GU in the nature of their relationship, but also the question of the existence of a connection between them and its nature. HU in children is a more hereditary trait that increases cholesterol, triglycerides, and fatty acids, and also affects insulin-mediated glucose transport. A high association between HU and primary AH was revealed, and therefore HU is considered as a risk factor for AH, which is associated with the suppression of the mechanism of endothelial-dependent vascular relaxation. A high association of HU with obesity, atherosclerosis, and type 2 diabetes mellitus was revealed; HU at the population level can be considered as an indicator of hormonal and metabolic changes in atherosclerosis and diabetogenicity. Currently, disturbances in purine metabolism in MS are covered ambiguously, therefore, early diagnosis of HU in the totality of MS is an important scientific and practical task, the solution of which makes it possible to take a different look at the nature of MS; Longterm existence of hormonal and metabolic changes leads to earlier onset and clinical manifestation of MS. Isolation of MS in its early stages is of great clinical importance, 1 since this condition is reversible, i.e. with appropriate treatment, it is possible to achieve the disappearance or reduction in the severity of its main manifestations [2,20]. Risk factors for the development of MS are present 8 from an early age. Therefore, children and adolescents seem to be the optimal contingent for studying the early features of the formation of diseases of the II components of MS. The high risk factors for developing MS include the presence of viscero-abdominal obesity in children under

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10 years old, | burdened heredity for diseases (2 or more) associated with insulin resistance (IR) and purinoses (hypertension, gout, diabetes mellitus, obesity, cholelithiasis and urolithiasis, [cardiovascular lesions). Gestational age is taken into account, low less than 12500 gr. or high 4000 g birth weight, no or short breastfeeding, accelerated growth of p and weight gain during the first year of life [5,12,14,15]. Along with risk factors in the manifestation of 9 individual components of MS, the severity of provoking factors 2. (external environment, lifestyle, nutrition, bad habits) is important [5,21]. MS in children indicates an increased risk of developing cardiovascular diseases in this contingent in the adult period. This risk has existed in a child since childhood, and therefore the purpose of the research should be to identify clinical and laboratory criteria not for the full clinical picture of MS, but for its risk factors. Since MS is a complex of interrelated metabolic and clinical disorders, the possibility of identifying its main components should be presented by simple public methods, which is especially important for outpatient polyclinic service. [1,2,5].

Despite numerous studies of MS in children and adolescents around the world, in domestic pediatrics, there are only narrowly focused studies on the study of its individual components, which, in conditions of changing ecology, nutrition, lifestyle, and stressful effects, are outdated and do not exhaust the importance of the issue. Features of the national way of life, and lifestyle can significantly affect the criteria for diagnosing MS in children and adolescents and differ significantly from other countries. All this requires the creation of universal methods and criteria for early diagnosis, and the creation of an optimal classification for our region, with the help of which it will be possible to adequately form risk groups and conduct rational prevention and treatment of children and adolescents with MS. Ultimately, all this will help reduce morbidity and mortality in adulthood from such widespread diseases as coronary artery disease, arterial hypertension, atherosclerosis, and diabetes mellitus.

References

1. Alexandrova A.A., Rozanov V.B. Epidemiology and prevention of blood pressure in children and adolescents. //Russian pediatric journal.- 1998. -№2. -FROM. 16-20

2. Кудратова Г., Холмурадова З. Болаларда ва ўсмирларда семизликни кечиши //Евразийский журнал медицинских и естественных наук. – 2023. – Т. 3. – №. 11. – С. 110-114.

3. Кудратова Г., Холмурадова З. Ўсмир болаларда кон босими ошишини бирламчи даражасини диагностикаси, клиникаси, профилактика ва давоси

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//Евразийский журнал медицинских и естественных наук. – 2023. – Т. 3. – №. 8. – С. 107-111.

4. Balykova L.A., Soldatov O.M., Samoshkina E.S., Pashutkina O.V., Balykova A.V. Metabolic syndrome in children and adolescents. // Pediatrics (Russia). 2010.-№3. pp. 127-132.

5. Ginzburg M.M. Kryukov N.N. Obesity. Influence on the development of metabolic syndrome. Prevention and treatment. Moscow. 2002. - S. 89

6. Garifulina Lilya Maratovna, Kholmuradova Zilola Ergashevna Integrated clinical and metabolic evaluation of the condition of children with obesity and arterial hypertension // Achievements of science and education. 2020. №8 (62).

7. Garifulina L. M. et al. the Psychological status and eating behavior in children with obesity //Issues of science and education. $-2020. - N_{\odot}. 26. - C. 110.$

8. Delov I.I., Melnichenko G.A., Romantseva T.N. Pathogenetic aspects of obesity. // Obesity and metabolism. - 2004. -X -S. 3-9

9. Zimin 10.V., Metabolic disorders within the framework of metabolic syndrome X (insulin resistance syndrome): the need for strict application of the criteria for diagnosing the syndrome. //Cardiology. -1999 - N_{28} , - S. 37-41

10. Kobalova Zh.D., Tolkacheva V.V., Karaulova Yu.L. Uric acid is a marker and/or a new risk factor for the development of cardiovascular complications.// Russian Medical Journal (cardiology series). 2002. - No. 10. - pp. 431-436

11. L. V. Kozlova, V. V. Bekezin, S. B. Kozlov, I. S. Kozlova, O. V. Peresetskaya, and O. M. Kovalenko, Russ. Metabolic syndrome in children and adolescents with obesity: diagnosis, criteria for working classification, treatment features // Pediatrics (Russia). 2009 .- X "6. pp. 142-150.

12. Madyanov I.V., Balabolkin A.A. Experimental evaluation of the diabetogenic effects of uric acid // Problems of endocrinology. - 1997. - X "1. - S. 36-37.

13. Metitskaya A.V. The relationship of increased body weight of metabolic disorders and blood pressure in adolescent children. Abstract. Diss.... candidate of medical sciences. Ufa. 2006. From 22

14. Metabolic syndrome in children and adolescents./ Edited by Kozlova L.V. Moscow. 2008, p. 96

15. Moreno I.G., Neudakhin E.V., Gur'eva E.N., Dudareva I.S., Elagina G.I., Mizernitskaya A.A. Metabolic syndrome in children and adolescents: issues of pathogenesis and diagnosis // Pediatrics (Russia).2010.- No. 4. pp. 116-118.

16. Musadzhanova L.Kh. Characterization of adaptive and borderline conditions of the cardiovascular system in children. Abstract of diss ... doc. honey. Sciences. Tashkent 1998. From 36

66



17. Malyavskaya S.I. Pediatric metabolic syndrome: a high risk state / Pediatrics (Russia). 2010, - No. 4. pp. 119-121.

18. Kholmuradova Zilola Ergashevna, Khaydarova Khaticha Ramizovna, & Ibragimova Yulduz Botirbekovna. (2022). Obesity and the Functional State of the Cardiovascular System in Children. Eurasian Medical Research Periodical, 8, 48–51.

19. Kholmuradova Z. E., Garifulina I. M., Kudratova G. N. Functional status of the endothelium in the cardiovascular system in obese children //Journal Biomeditsiny and practice. – 2022. – T. 7. – №. 2.

20. Roitberg G.U., Ushakova T.I., Dorosh J.V. The role of insulin resistance in the diagnosis of metabolic syndrome. // Cardiology. - 2004. - No. 3. - C94-101

21. Marufovna T. Z., Marufovna T. F. Samarkand KZE Arterial Hypertension as a Sign of Disorder of the Cardiovascular System in Children and Adolescents with Overweight and Obesity //Eurasian Research Bulletin. - 2023. - T. 18. - C. 53-58.

22. L. M. Garifulina, Z. E. Kholmuradova, KudratovaG. N. / Features of implementation of cardiovascular system pathology in children with obesity, improvement of prevention and treatment. Journal of hepato-gastroenterology research. 2023. vol. 4, issue 3. pp.8-10





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