

METABOLIC SYNDROME AND OBESITY IN CHILDREN AS A SOCIAL AND HYGIENIC ISSUE

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The problem of pediatric obesity focused on risk factors at early stages because their modification can reduce the risk of later metabolic diseases and disability. It is the metabolic syndrome that describes a set of cardiometabolic risk factors, including abdominal obesity, insulin resistance, elevated blood pressure, high level of triglycerides and low level of high-density lipoproteins that increase the risk of cardiovascular diseases and type 2 diabetes mellitus. Obesity mainly determines statistical values that characterize the case with endocrine gland diseases among children and adolescents in the Republic of Tatarstan. Obesity is not growing at the same rate any more. The current level of excessive weight in children is too high and requires intervention at the level of the community and school. Inactivity and non-rational nutrition can contribute to formation of excessive body mass among children. Regular physical activity and better nutrition of adolescents is a worthy investment in the health of future generations.

Keywords: metabolic syndrome, obesity, prevention, hygiene, physical activity

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МЕТАБОЛИЧЕСКИЙ СИНДРОМ И ОЖИРЕНИЕ У ДЕТЕЙ КАК СОЦИАЛЬНО-ГИГИЕНИЧЕСКАЯ ПРОБЛЕМА

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Проблема детского ожирения поставила в центр внимания факторы риска на ранних стадиях, так как их модификация может снизить риск более поздних метаболических заболеваний и инвалидности. Ожирение больше не растёт теми же темпами, текущий уровень избыточного веса и ожирения у детей слишком высок и требует вмешательства на уровне сообщества и школы. Малоактивный образ жизни, нерациональное питание могут вносить вклад в формирование избыточной массы тела среди детского населения. Регулярная физическая активность подростков, наряду с улучшением их питания, является достойной инвестицией в здоровье будущих поколений.

Ключевые слова: метаболический синдром, ожирение, профилактика, гигиена, физическая активность

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In 2019, 18% of children aged 5 to 19 and 6% of children under five years had an excessive weight or obesity. Moreover, 340 million of children and adolescents aged 5–19 had an excessive weight or obesity. The recent international and national studies display a growing obesity epidemic among schoolchildren, especially among children aged 6–19 during the last three decades [1]. Obesity is no longer growing at the same rate, the current level of excessive weight and obesity in children is too high and requires intervention at the level of the society and school [2]. It is the metabolic syndrome that describes a set of cardiometabolic risk factors, including abdominal obesity, insulin resistance, increased blood pressure, high level of triglycerides and low level of high-density lipoproteins that increase the risk of cardiovascular diseases and type 2 diabetes mellitus [3]. Obesity largely determines statistical values that characterize the case with endocrine gland diseases among children and

adolescents in the Republic of Tatarstan. It is impossible not to pay attention to more than a two-fold increase in prevalence of obesity among patients aged 15–17 during the period. The fact needs analysis and immediate actions [4].

The probability of obesity developed among the adults who had an excessive body mass in childhood is increased 5 times as compared with children having a normal body mass. Inactivity and improper nutrition can contribute to an excessive body mass among children [5]. Thus, understanding determinants of children's obesity and their interactions is fundamental to development of strategies aimed to struggle the epidemic [6–11].

The problem of pediatric obesity has put risk factors at early stages in the center of attention, as their modification can reduce the risk of later metabolic diseases and disability. In the Republic of Tatarstan, a number of children with obesity has

increased many times within the last 20 years. In 2020, there were 14.2 thousand people in the Republic of Tatarstan [4].

Modern data about epidemiology and reasons for obesity in children and adolescents along with modern treatment strategies are described in reviews by Hiba Jebeile, Aaron S Kelly, Grace O'Malley, Louise A Baur. Prior to COVID-19, the prevalence of obesity among children and adolescents in many countries with a high level of income has reached the plateau though the level of obesity increased. In the pandemic, children and adolescents from several countries managed to gain weight. Obesity is associated with cardiometabolic and psychosocial comorbidity and premature morbidity among adults. Developed and preserved obesity is mainly explained by a biosocioecological scheme where the biological predisposition, socioeconomic and ecological factors interact and promote deposition and growth of fatty tissue.

First-line therapy involves family behavioral activities to fight obesity, including diet, physical activity, inactivity and quality of sleep along with the strategies of changed behavior. The benefit of intense dietary approaches, pharmacotherapy, metabolic and bariatric surgeries as additional treatment methods is proven. However, the majority of countries have a limited access to these treatment modalities. The studies confirm that formation of the program for personalization and individualization of obesity treatment in children and adolescents and their implementation in clinical practice are still necessary [12].

According to Kyle R Leister, Burak T Cilhoroz, Jared Rosenberg, Elise C Brown, Joon Young Kim, variation in the parameters of metabolic syndrome (MS) in children prevents consensus in relation to diagnostic criteria in this population. In spite of these irregularities, it has been found out that physical exercises can mitigate the negative consequences of MS. The studies confirm that adolescents with MS have a higher probability to obtain metabolic complications as soon as they become older. The studies of the prognostic nature of MS in adolescents concentrate on the association with the future development of MS as an adult, type 2 diabetes mellitus, cardiovascular diseases and atherosclerosis. General criteria of the studies include measurements of BMI, HDL, triglycerides, glucose and BP. The studies have shown that the presence and severity of MS in childhood can be associated with an increased rate of MS and other cardiovascular diseases subsequently. The conclusions show that it is important to eliminate MS-associated symptoms in adolescents to prevent MS and/or cardiovascular diseases as adults [13].

According to Jie Cai, Yaping Zhao, Jing Wang, Lei Wang, physical activity among children can be developed with support of the society. Government, community, educational institutions, kindergartens and children's sports clubs should cooperate to create a system of social support of physical activity of children within a family. In accordance with analysis of the authors, it

has been found out that Government plays a guiding role in the development of physical activity of children in a family by way of creation and implementation of the program aimed at prevention and periodic health examination of children with metabolic syndrome and obesity. It is the society that provides additional support to physical activity of children in a family. Thus, it is necessary to develop an adequate set of population and personalized medical and preventive along organizational and administrative activities aimed to prevent obesity. An educational institution is not just a center of development of physical activity of children in a family. It also plays an important role in promotion of physical upbringing of children among parents [14].

CONCLUSIONS

Based on the study results, certain recommendations concerning nutrition and physical activity of students can be developed and effective educational programs can be determined. Excessive body mass and obesity in children and adolescents can be prevented due to interventions aimed at the change in the way of life, formation of a habit to physical activity and rational nutrition. Prevented obesity in children can produce a favorable effect on health not only in childhood, but also in an adult life [5]. Several risk factors, which are interrelated and enhance the effect of one another, thereby greatly increasing the risk, are commonly found in one child. The basis of health and healthy habits are established in childhood, with proper nutrition and physical activity being an essential part hereof.

Early diagnostics of metabolic disturbances will enable to detect a group of risk requiring close monitoring and immediate actions. An excessive body mass, especially obesity, increases a risk of cardiovascular diseases, non-insulin dependent diabetes mellitus, different forms of cancer and disability.

Teaching physical culture and formation of a healthy lifestyle, which requires well prepared and motivated teachers, should play a key role in the area of health during the entire life. Promotion of a healthy lifestyle through a regular physical activity and proper nutrition in childhood and adolescence along with simultaneous adoption of professional preventive measures to reduce excessive body mass and obesity is crucial to public health. Regular physical activity and proper nutrition should be part of a daily life. Secondary school children probably belong to the most suitable contingent to promote proper nutrition and regular physical activity; they can also promote involvement of parents and a broader public. Regular physical activity and improved nutrition of adolescents are a worthy investment in health of future generation. The results obtained during the study should be taken into account while developing the strategies of preventing obesity in children, including a wider involvement of families and preventive work at schools [15–20].

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