

FREQUENCY OF RISK FACTORS OF OVERWEIGHT AND OBESITY IN YOUNG PEOPLE
(Literature review)

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✓ *Resume*

This review presents recent observations on the prevalence of overweight and obesity in different countries among young people, of different sex, social status and ethnicity. The article presents and analyzes the developmental risks for humans and concomitant diseases leading to disability and death according to the data of domestic and foreign researchers. Priority directions of overweight correction were determined, among them nutritional correction.

Key words: obesity, young age, overweight, risk factors

**ЧАСТОТА ФАКТОРОВ РИСКА ИЗБЫТОЧНОГО ВЕСА И ОЖИРЕНИЯ У ЛИЦ
МОЛОДОГО ВОЗРАСТА**
(Литературный обзор)

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✓ *Резюме*

В представленном обзоре приведены наблюдения последних лет о распространенности избыточного веса и ожирения в разных странах среди лиц молодого возраста, разного пола, социального статуса и этнической принадлежности. Приведены и проанализированы риски развития для человека и сопутствующие заболевания, приводящие к инвалидизации и смерти по данным отечественных и зарубежных исследователей. Определены приоритетные направления коррекции избыточной массы тела, среди них и коррекция питания.

Ключевые слова: ожирение, молодой возраст, избыточная масса тела, факторы риска

ЁШЛАРДА ОРТИҚЧА ВАЗН ВА СЕМИЗЛИК ХАВФ ОМИЛЛАРИНИНГ ЧАСТОТАСИ
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✓ *Резюме*

Ушбу шарҳда сўнгги йилларда турли мамлакатларда ёшлар орасида ортиқча вазн ва семиришнинг тарқалиши, жинси, ижтимоий мавқеи ва миллати бўйича кузатувлар келтирилган. Мақолада маҳаллий ва хорижий тадқиқотчилар маълумотларига кўра инсон учун хатарлар ва ногиронлик, ўлимга олиб келадиган қўшма касалликлар келтирилган, таҳлил қилинган. Ортиқча вазнни тўғирлашнинг устувор йўналишлари аниқланди, улар орасида овқатланишни тўғирлаш ҳам бор.

Калит сўзлар: семириш, ёшлик, ортиқча вазн, хавф омиллари.

Relevance

According to the WHO definition, obesity is considered “abnormal or excessive accumulation of fat that can adversely affect human health” [13]. The following are some recent global estimates from WHO:

Overweight and obesity facts

In 2016, more than 1.9 billion adults over 18 were overweight. Of these, over 650 million were obese [3,13].

- According to 2016 data, 39% of adults over 18 years of age (39% of men and 40% of women) were overweight.

- In 2016, about 13% of the world's adult population (11% of men and 15% of women) were obese.

- Between 1975 and 2016, the number of obese people worldwide more than tripled. It is estimated that in 2016, about 41 million children aged up to 5 years were overweight or obese. Overweight and obesity, previously thought to be common in high-income countries, are now becoming more prevalent in low- and middle-income countries, especially in cities. In Africa, the number of obese children under 5 years of age has grown by almost 50% since 2000. In 2016, almost half of overweight or obese children aged up to 5 years lived in Asia [3].

- Obesity was previously thought to be relevant in countries with high living standards, but the number of overweight and obese children is now on the rise in low- and middle-income countries, especially in urban settings. Currently, more than 30 million overweight children live in developing countries and 10 million in developed countries [15].

The World Health Organization has officially revised age standards. And now a young man is considered to be 44 years old [WHO]. In young people born in the 90s of this century, the risk of obesity is two to three times higher than that of the rest of their family members who were born in the period from the 50s to the 80s of the last century, including their older brothers and sisters. This was shown by a recent study of British scientists. Now this metabolic disorder, to one degree or another, is noted in an increasingly growing number of young people. Obesity is rapidly getting younger. Since many adolescents aged 12 to 17-18 years old suffer

from this pathology [1,15]. In most developed European countries, obesity affects 15 to 25% of the adult population. Recently, there has been an increase in the incidence of obesity in children and adolescents around the world: in developed countries of the world, 25% of adolescents are overweight, and 15% are obese. Childhood overweight is a significant predictor of obesity in adulthood: 50% of children who were overweight at age 6 become obese in adulthood, and this probability increases to 80% in adolescence [14].

The epidemiology and incidence of many chronic diseases, including obesity, depend on racial and ethnic differences, as well as on the characteristics of geographic and socio-economic conditions of life.

A number of foreign researchers attribute overweight and obesity to complex, multifactorial, multigenic disorders, which are closely related to the characteristics of the psychosocial and cultural environment. In general, more people die from the effects of overweight and obesity worldwide than from the effects of abnormally low body weight. The number of obese people exceeds the number of people who are underweight; this case observed in all regions except some regions of Africa south of Sahara and Asia [10]

Therefore, the problem of obesity in our time is becoming more and more urgent and begins to pose a social threat to people's lives. This problem is relevant regardless of social and professional affiliation, area of residence, age and gender. The significance of the obesity problem is determined by the threat of disability in young patients and a decrease in the overall life expectancy due to the frequent development of severe concomitant diseases. These might include type 2 diabetes mellitus, arterial hypertension, dyslipidemia, atherosclerosis and related diseases, reproductive dysfunction, cholelithiasis, osteochondrosis. Obesity reduces resistance to colds and infectious diseases, in addition, dramatically increases the risk of complications during surgery and injury [10,13].

Obesity significantly reduces life expectancy on average from 3-5 years with a slight excess weight, up to 15 years with severe obesity. In almost two cases out of three, human death occurs from a disease associated with impaired fat metabolism and obesity. Obesity is a colossal social problem. Most of these individuals suffer from not only illness and limited mobility; they have low self-esteem, depression, emotional distress and other psychological problems due to prejudice, discrimination, and isolation in their society. In

society, the attitude towards sick obesity is often inadequate, at the everyday level, it is believed that obesity is a punished gluttony, punished laziness; therefore, the treatment of obesity is everyone's personal business. Indeed, the public consciousness is still far from the idea that obese people are sick people, and the cause of their illness is often not in an uncontrolled addiction to eating, but in complex metabolic disorders leading to an excess accumulation of fat and adipose tissue. The social significance of this problem is in the fact that people suffering from severe obesity can hardly get a job. Obese people experience discriminatory restrictions on promotion, everyday household inconveniences, restrictions on movement, in the choice of clothes, inconvenience in taking adequate hygiene measures; sexual dysfunction is often observed. Therefore, the society has not yet finally realized the need to create and implement programs to prevent obesity [10].

A healthy person contains 10-20 kg of pure fat (women have more than men do). Considering its high caloric content (9.3 kcal / g compared to 4.1 kcal / g for glucose), it can be calculated that people have a constant supply of "fuel" of about 100-180 thousand kilocalories. This is enough to provide the body's energy needs for 40 days. However, since fat is constantly consumed for various needs, its depot has to be replenished. In young and middle-aged men, the daily energy expenditure ranges from 2600 kcal for light work to 5000 kcal for hard physical labor. It is curious that even if a person does nothing, but rests in a comfortable chair, to maintain the so-called basic metabolism, he still "takes out and puts" 1600-1700 kcal [9,12].

WHAT IS FAT AND WHERE IT COMES FROM

Simple fats are compounds of a trihydric alcohol of glycerol with three fatty acids and contain only three chemical elements - carbon, hydrogen and oxygen. It should be remembered that a person can synthesize fat from carbohydrates. This is especially true for beer drinkers; their distinguishing feature is "beer belly" (although beer does not contain fat) [12].

The fats found in the body of different animals differ in the length of the fatty acid chains and the presence of double bonds in them. The fewer double bonds, the tighter the fatty acid molecules are adjacent to one another, and the fat is firmer. Vegetable fats remain liquid even in the refrigerator. The body is able to build on and shorten chains, and therefore can be satisfied with

any fat. Still, the consumption of animal fats, including butter, is mandatory for humans - only they contain vitamins A and D (carrots and yeast contain their precursors - carotene and ergosterol) [12].

Vegetable fats contain polyunsaturated fatty acids, which are essential for humans - linoleic and linolenic. They are so important to the body that they are considered vitamins (vitamin F). In addition, vegetable oils are source of vitamin E, which is found in animal products only in the liver [9,12]. It is curious that the heart can use fatty acids for work, but feed the brain with pure glucose. Muscles use glucose at low load, and at high load, they switch to fats. Consequently, the hustle and bustle of household and kitchen chores "eats" glucose without affecting fat stores [12].

In general, adipose tissue in the body performs, in addition to the above-mentioned, many useful functions. It serves as a heat insulator, participates in water exchange, processes of converting carbohydrates into fats and vice versa, passive neutralization (deposition) of harmful substances, accumulation of fat-soluble vitamins (A, D, E) take place in it. However, perhaps the least known to the public is the endocrine function of adipose tissue. But it is its disturbances that can contribute to the emergence or progression of obesity and related diseases [4,9].

An important stage in the metabolism (conversion) of male sex hormones (namely, testosterone) to female sex hormones (estrogens) occurs in fat cells. The rate of this transformation increases with the growth of fat accumulation, especially abdominal. Therefore, obese men can acquire some secondary female sexual characteristics and disorders in the male genital area [4,9,12].

Leptin, a hormone that signals to the hypothalamus (part of the brain) about the amount of fat depots, is also produced mainly by fat cells. It is part of a complex system that regulates eating behavior and energy expenditure in the body, i.e., ultimately, body weight. The effects of leptin extend to other endocrine organs - the thyroid gland, adrenal glands, gonads, possibly the immune and autonomic nervous systems [4,8].

Hormonal regulation of fat usage.

Seven hormones have a strong regulatory effect on fat metabolism:

1) Epinephrine and norepinephrine are two hormones that work under stressful reactions. Short-term and severe stress, heavy physical

activity cause the mobilization of fat from the depot.

2) ACTH. The release of the hormone also increases under stress, while under the influence of ACTH, the release of cortisol increases. Cortisol is a planned stress hormone unlike adrenaline and norepinephrine. Cortisol has a ketogenic effect on fat mobilization. If stress is of a long-term nature, then a prolonged and persistent increase in cortisol leads to obesity, which is accompanied by Itsenko-Cushing's syndrome / disease.

3) Growth hormone. It activates lipolysis and thus increases fat breakdown. With obesity, the concentration of the hormone decreases due to an increase in the concentration of free fatty acids and insulin.

4) Thyroid hormones. They stimulate the mobilization of fats, as they increase the basal metabolism in cells. With a deficiency of triiodothyronine, thyroxine, hypothyroidism, obesity is observed, since the level of basal metabolism in cells decreases.

5) Insulin. Activates the process of synthesis and storage of fat - lipolysis. [4] The development of obesity can follow two scenarios. In the first case, the number of fat cells (adipocytes) remains constant, but fat accumulates in each of them. The normal volume of an adipocyte is 0.3 microliter; the limiting one is 1 microliter. Consequently, no matter how much fat is stored, the depot will not increase more than 3-4 times. This form of obesity is called hypertrophic and usually develops in adulthood [12]

In the second option, fat cells multiply and their number increases. New cells release a substance that increases appetite. The number of cells, and at the same time the excess body weight, increases to exorbitant values.

This type of obesity (called hyperplastic) is more often associated with a hereditary predisposition and begins much earlier. The greatest risk for the development of this kind of obesity occurs in adolescence, during pregnancy and in menopause [12]. According to the location of fatty accumulations, two types of simple obesity are distinguished: android (male) and gynoid (female). The gynoid type of obesity is also called pear-shaped, since fat is deposited mainly on the thigh and buttocks. By analogy, the android type, in which fat deposits are mainly on the abdomen and chest is called apple shaped.

By the way, cells that form deposits of the gynoid type are able to synthesize and accumulate

female sex hormones, which support sexuality in women in the postmenopausal period and protect against atherosclerosis. Therefore, a small fat layer in the thigh is necessary for women.

The android type gives more complications than the gynoid type. Fat deposits in the abdomen are often located not under the skin, but around the internal organs (visceral, or "internal" obesity). In general, hyperplastic, android and visceral obesity is considered more dangerous, and hypertrophic, gynoid and subcutaneous obesity is considered less dangerous. The first combination brings a whole bunch of troubles, the second - only minor problems. This bouquet, in addition to simple inconveniences, includes atherosclerosis, ischemic heart disease, cerebrovascular thrombosis, fatty liver, varicose veins, diabetes, gout, arthrosis, chondrosis and cancer [12].

Reasons for the increased incidence of obesity among young people

Sedentary lifestyle: The motor activity of the current adolescent is much less than his peer, living 1-2 generations ago. A fundamental role in this is played by the introduction of various scientific and technical innovations into everyday life.

The overwhelming majority of young people today prefer to sit for a long time at a computer, tablet or laptop to live communication, dancing, hiking, sports games. A certain role in the formation of excess weight was played by the way of life itself, which has radically changed over the past decades. Many young men and women today live in urban conditions. Moreover, they do not need to help their parents with the housework - chopping wood, looking after domestic animals, working in the field. [4,7]

Unhealthy food

Nutrition, like lifestyle, has also changed dramatically. Indeed - not for the better. Thanks to intrusive advertising, fast food is very popular among young people. Hamburgers, cheeseburgers, hot dogs, shaurma include trans fats, synthetic additives, and easily digestible carbohydrates. The physiological value of these components is not that minimal - zero. Without bringing any benefit, but only harm, they are quickly deposited in soft tissues in the form of fatty accumulations. The same is true for the rest of the seemingly harmless offal - crackers, bars, and even soft drinks. Moreover, complete food, containing in optimal quantities everything that is needed for a young organism, can be found less and less on store

shelves. In addition, some parents, in their care, lose all sense of proportion and reality - a son or daughter with a normal weight seems overly thin to them. There is a banal overfeeding.

Hormonal imbalance

The period of puberty is accompanied by changes in the level of various hormones. Moreover, these changes do not occur smoothly, but abruptly. At a certain stage, dys hormonal disorders can manifest themselves as overweight.

Accelerating life rhythm.

The overwhelming majority of adolescents are not characterized by a measured lifestyle. They are in a hurry; they have many things to do. In a constant rush, there is no time to even eat normally. However, eating should be regular and unhurried. Eating small meals frequently on the go also does not help you lose weight.

Stress, disturbances in sleep and rest

Teenage maximalism, emotional lability - all these are reasons for negative emotional manifestations. Young people can experience nervous stress and strong feelings even where there is no objective reason for this. Frequent sleep disturbances are also characteristic, in particular, lack of sleep [4,7].

WHO has also developed the Global Action Plan for the Prevention and Control of Noncommunicable Diseases for 2013–2020 as part of the implementation of the commitments made in the UN Political Declaration on Noncommunicable Diseases (NCDs), endorsed by Heads of State and Government in September 2011. The Global Plan of Action will contribute to progress towards the achievement of nine global targets for noncommunicable diseases by 2025, including a 25% reduction in premature deaths from NCDs and a stabilization of the global number of obesity cases at the 2010 level [11].

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