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BASIC RISK FACTORS FOR OBESITY IN YOUNG ADULTS ANNOTATION

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ABSTRACT

Obesity is a common and serious disease

• The US obesity prevalence was 41.9% in 2017 – March 2020.

• From 1999 –2000 through 2017 –March 2020, US obesity prevalence increased from 30.5% to 41.9%. During the same time, the prevalence of severe obesity increased from 4.7% to 9.2%.

• Obesity-related conditions include heart disease, stroke, type 2 diabetes and certain types of cancer. These are among the leading causes of preventable, premature death.

• The estimated annual medical cost of obesity external icon in the United States was nearly $173 billion in 2019 dollars. Medical costs for adults who had obesity were $1,861 higher than medical costs for people with healthy weight.

KEYWORDS: *Obesity, Young Age, Basic Risk Factors.*

INTRODUCTION

Some recent global estimates from WHO are summarized below:

- In 2016, about 13% of the world's adult population (11% of men and 15% of women) were obese.
- From 1975 to 2016, the number of obese people worldwide more than tripled. It is estimated that in 2016, about 41 million children under the age of 5 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 under 5 years of age lived in Asia. [49]

Young people born in the 90s of this century, the risk of obesity is two to three times higher than 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 siblings. This was shown by a recent study by British scientists. Now this metabolic disorder, to one degree or another, is observed in an increasingly growing number of young people. Obesity is rapidly getting younger. And now many adolescents aged 12 to 17-18 years old suffer from this pathology.

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 that are closely related to the characteristics of the psycho-socio-cultural environment.

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 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, sharply increases the risk of complications during surgery and injury.

Obesity significantly reduces life expectancy on average from 4-6 years with a slight excess weight, up to 20 years with severe obesity. In almost two cases out of three, a person's death occurs from a disease associated with impaired fat metabolism and obesity. Obesity is a colossal social problem. Most of these individuals suffer not only from illness and limited mobility; they have low self-esteem, depression, emotional distress and other psychological problems due to prejudice, discrimination and isolation in society. In society, the attitude towards patients with obesity is often inadequate; at the household level, it is believed that obesity is a punished gluttony, punished laziness, therefore, the treatment of obesity is everyone's personal business. Really, public consciousness is still far from the idea that obese people are sick people, and the cause of their illness is often not an unbridled addiction to food, but in complex metabolic disorders leading to an excessive accumulation of fat and adipose tissue. The social significance of this problem is that severely obese people find it difficult to get a job. Obese people experience discriminatory restrictions on promotion, everyday household inconveniences, restrictions on movement, in choosing clothes, inconvenience in taking adequate hygiene measures; sexual dysfunction is often observed. Therefore, society has not yet finally realized the need to create and implement programs for the prevention of obesity. and the cause of their illness is often not in an unbridled addiction to food, but in complex metabolic disorders leading to an excessive accumulation of fat and adipose tissue. The social significance of this problem is that severely obese people find it difficult to get a job. Obese people experience discriminatory restrictions on promotion, everyday household inconveniences, restrictions on movement, in choosing clothes, inconvenience in taking adequate hygiene measures; sexual dysfunction is often observed. Therefore, society has not yet finally realized the need to create and implement programs for the prevention of obesity. and the cause of their illness is often not in an unbridled addiction to food, but in complex metabolic disorders leading to an excessive accumulation of fat and adipose tissue. The social significance of this problem is that severely obese people find it difficult to get a job. Obese people experience discriminatory restrictions on promotion, everyday household inconveniences, restrictions on movement, in choosing clothes, inconvenience in taking adequate hygiene measures; sexual dysfunction is often observed. Therefore, society has not yet finally realized the need to create and implement programs for the prevention of obesity. can hardly get a job. Obese people experience discriminatory restrictions on promotion, everyday household inconveniences, restrictions on movement, in choosing clothes, inconvenience in taking adequate hygiene measures; sexual dysfunction is often

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A healthy person contains 15-25 kg of pure fat (women have more than men). Given its high calorie 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 150-180 thousand kilocalories. This is enough to provide the body's energy needs for 40 days. But 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 2,500 kcal for light work to 5,000 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, take out and put 1600-1900 kcal.

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).

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 each other, and the fat is firmer. Vegetable fats remain liquid even in the refrigerator. The body is able to build on and shorten chains, and for this purpose can be satisfied with any fat. But 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).

Vegetable fats contain essential for humans polyunsaturated fatty acids - linoleic and linolenic. They are so important to the body that they are considered vitamins (vitamin F). In addition, vegetable oils are a source of vitamin E, which is only found in the liver in animal products.

It is curious that the heart can use fatty acids for work, but feed the brain with pure glucose. Muscles use glucose at a low load, and at an increased load they switch to fats. Consequently, the hustle and bustle of household and kitchen chores "eats" glucose without affecting fat stores.

In general, adipose tissue in the body performs, in addition to the aforementioned, a lot of useful functions. It serves as a heat insulator, participates in water metabolism, 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. But perhaps the least known to the general public is the endocrine function of adipose tissue. But it is precisely its violations that can contribute to the emergence or progression of obesity and related diseases.

An important stage in the metabolism (transformation) of male sex hormones (namely testosterone) into 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 may acquire some secondary female sexual characteristics and disorders in the male genital area.

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, and possibly the immune and autonomic nervous systems.

In most adults, body mass index (BMI) is closely correlated with adipose tissue, which is calculated using the formula BMI = weight (kg) / height2 (m). Underweight: BMI less than 18.5 kg / m2.

Normal weight: BMI from 18.5 to 24,9.

Overweight: BMI more than 25, but less than 29,9.

Obesity grade I: BMI more than 30, but less than 34,9.

Obesity grade II: BMI more than 35, but less than 39,9.

Obesity grade III: BMI more 40, but less than 44,9.

IV grade obesity: BMI more than 45 kg / m2.

BMI is not suitable for assessing the condition of some athletes (for example, weightlifters, bodybuilders), pregnant and lactating women, as well as fragile elderly people.

There are two types of obesity: central (abdominal) - with the predominant formation of a fat depot in the abdominal cavity (typical for men) and peripheral - with fat deposition mainly under the skin (more common in women). It is with the first type of obesity that most health problems are associated: type 2 diabetes mellitus, hypertension, atherosclerosis, metabolic syndrome.

Primary obesity appears to be related to heredity. It is noticed that if both parents are obese, then in children it occurs in 80% of cases, if one - in 60%, and if the parents are of normal weight - then the probability decreases to 15%. Nevertheless, despite the genetic predisposition, obesity is an acquired disease. There is a mechanism in the body that maintains a constant level of fat (lipostasis). In obesity, the balance between calorie intake and calorie expenditure is disturbed, fat accumulates and then its amount stabilizes at a new, higher level. The regulation mechanism can break down for various reasons, for example, due to constant overeating. The bad habit of eating more food than is required, combined with heredity, turns into a disease.

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 0.4 microliter, the limiting one is 1 microliter. Therefore, 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.

In the second option, fat cells multiply and their number increases. New cells secrete a substance that increases appetite. The number of cells, and at the same time the excess body weight, increase to exorbitant values. This type of obesity (it is called hyperplastic) is often associated with a hereditary predisposition and begins much earlier. The greatest risk for developing this type of obesity occurs during adolescence, pregnancy and menopause.

According to the location of fat 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 thighs and buttocks. By analogy, the android type, in which body fat is found mainly on the abdomen and chest, is called apple.

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 thighs is a must 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. In general, hyperplastic, android and visceral obesity is considered more dangerous, while hypertrophic, gynoid and subcutaneous obesity is considered less dangerous. The first combination brings a whole bunch of troubles, the second - only individual flowers. This bouquet, in addition to simple inconveniences, includes atherosclerosis, ischemic heart disease, thrombosis of cerebral vessels, fatty liver, varicose veins, diabetes, gout, arthrosis, chondrosis and cancer.

Causes for the increased occasions of obesity among young people

Sedentary lifestyle

The motor activity of the current adolescent is much less than his peer who lived 2-3 generations ago. The 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 over 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. And they do not need to help their parents with the housework - chopping wood, looking after domestic animals, working in the field.

Unhealthy food

Nutrition, like lifestyle, has also changed dramatically. And - not for the better. Thanks to intrusive advertising, fast food (fast food) is very popular among young people. Hamburgers, cheeseburgers, hot dogs, shawarma include Trans fats, synthetic additives, 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. And complete food, containing in optimal quantities everything that is needed for a young body, is less and less likely to be found on store shelves. Besides, 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

Puberty is accompanied by changes in the level of various hormones. Moreover, these changes do not occur smoothly, but in leaps and bounds. At a certain stage, dishormonal disorders can manifest themselves as overweight.

Accelerating the pace of life

The overwhelming majority of adolescents do not have a measured lifestyle. They are in a hurry, they have a lot of things to do. In a constant rush, there is no time to even eat normally. But

eating should be regular and unhurried. Snacking small meals on the go also doesn't help you lose weight. [55]

And this problem applies not only to people who are obese, experts say: all those who carry excess fat are at increased risk.

In the pathogenesis of kidney damage in obesity, tubulointerstitial disorders predominate with the development of chronic inflammation, preceding glomerular damage and clinical manifestation of nephropathy. Some of the adverse effects of obesity on the kidneys may be the result of later developing comorbid conditions (diabetes mellitus (DM), arterial hypertension), but they also highlight the direct effect of adipose tissue on the kidneys, associated with the endocrine activity of substances produced by adipocytes, among which an important role belongs to adiponectin, leptin and resistin. As a result, a number of processes are triggered, including inflammation, oxidative stress, impaired lipid metabolism, activation of the renin-angiotensin-aldosterone system (RAAS), an increase in insulin production and the formation of insulin resistance (IR). Pathological changes include ectopic lipid accumulation and an increase in the amount of fatty deposits in the renal sinus, the development of glomerular hypertension and an increase in glomerular permeability due to hyperfiltration-induced damage to the glomerular filtration barrier and, ultimately, the development of glomerulomegaly and focal or segmental glomerulosclerosis.

Glomerulomegaly is the primary histopathological feature that distinguishes obesity glomerulopathy from primary focal segmental glomerulosclerosis (FSGS). Thickening of the glomerular basement membrane, which was previously considered the initial and early manifestation of hyperglycemia, diabetic nephropathy and nephrosclerosis associated with essential arterial hypertension, is detected on biopsy and in patients with obesity glomerulopathy at normal glycemic levels. Moreover, the thickness of the glomerular basement membrane directly correlates with the level of cholesterol and triglycerides. The clinical features of FSGS in obesity have been studied in detail by M. Praga et al. (2001) and included the absence of signs of nephrotic syndrome (edema, hypoalbuminemia) even with very high urinary protein excretion, as well as the slow progression of renal failure.

Among the main factors for the progression of kidney damage in obesity are: insulin resistance, hyperinsulinemia, dyslipidemia, impaired systemic and renal hemodynamics, ischemia of kidney tissue, auto- and paracrine effects of adipose tissue hormones. Insulin resistance is today considered as one of the key components of metabolic syndrome (MS), the frequency and severity of which in the human population has already acquired the character of a “global epidemic of the 21st century”.

WHO has also developed the Global Action Plan for the Prevention and Control of Noncommunicable Diseases 2013–2020. in line with 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 9 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.

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