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PATHOSPERMIA IN THE PATIENTS WITH HIGH BODY MASS INDEX

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Abstract

The retrospective analysis of pathospermia different types dependence on body mass index has been done. A trend of semen analysis deterioration with increase of body mass index has been revealed. Patients with a body mass index 26 – 29.9 kg / m^2 are at risk group for starting decline of semen analysis. This problem demands attention and further detailed study.

Key words: body mass index; semen analysis; pathospermia.

Introduction. Among the causes of infertility in married couples, the share of the male factor is 25-40%, therefore, the increase cases of male infertility is an urgent problem [1, 3, 5]. The prognosis for this component of family infertility is disappointing, since in the population of healthy men over the past 50 years, there has been a progressive decrease in the number and quality of spermatozoa. This was reflected in the last V revision of the reference indicators of ejaculate in reproductively healthy men (WHO, 2010) [1].

In general, in Ukraine, there is also an increase in both the total number of persons with this diagnosis registered and persons with a case proven for the first time. According to

statistics in 2001-2005 the number of registered persons increased by 24.8%, but in 2006-2010 it increased to 31.3%; and newly diagnosed cases increased by 17.6% and 48.6%, respectively [3]. According to the data of Ukrainian Association of Reproductive Medicine, the proportion of male infertility in comparison with female was 23.3% and 76.7%, respectively, which is associated with the same reasons [Ukrainian Association of Reproductive Medicine, 2015].

According to modern data, the frequency of the idiopathic infertility in Europe is up to 31-44% of all cases of male infertility. In Ukraine it is higher, which is associated with the low quality of diagnosis [1, 2, 4, 6].

The deterioration of the situation in most cases is associated with the spread of somatic pathology, especially among men of working age. In this aspect, diseases of the endocrine, cardiovascular system, and metabolism are of particular importance. Obesity is one of the leading causes, besides it often leads to the development of type 2 diabetes mellitus (DM 2) and androgen deficiency. The combination of these factors negatively affects various physiological processes which in their turn, significantly increase the risk of oxidative sperm stress development [4, 5].

Metabolic syndrome is a pathological complex that includes a number of metabolic and hormonal disorders, which is characterized by the presence of abdominal obesity (waist circumference in men> 94 cm) and the presence of at least two of the following factors:

• plasma glucose levels increase to more than 5.6 mol / l or the presence of a previously diagnosed diabetes mellitus;

• high density lipoproteins level recession to less than 1.03 mmol / l or taking of appropriate therapy;

• triglyceride levels increase to more than 1.7 mmol / l or taking appropriate medications;

• arterial hypertension more than 130/85 mm. Hg or taking antihypertensive drugs for previously identified hypertension.

Most increased body mass index (BMI) men together with violation of carbohydrate and fat metabolism often develop hypertension, coronary artery disease and diabetes mellitus, which leads to depression of sexual function. In addition, the phenomenon of insulin resistance, which naturally develops sooner or later at the progression of obesity, is characterized by impaired tissue sensitivity to glucose and leads to mitochondrial sperm deficiency [8].

In retrospective studies it was proved that a BMI> 25 kg / m^2 in men significantly increases the incidence of infertility compared to men with a BMI <20 kg / m^2 [9]. Similar results were confirmed in the QATAR study - the frequency of infertility in obese men (BMI> 30 kg / m^2) and DM-2 was thrice higher than in men with normal body weight (BMI <25 kg / m^2) [10].

The purpose: to conduct a retrospective statistical analysis of spermograms in men with different BMIs.

Material and methods. 4880 men were examined from March 2012 to December 2015 in acad. V.I. Grishchenko clinic for reproductive medicine. Spermogram analysis was accompanied by the formation of a patient's record with the entry of the physical examination parameters. All men under examination were differentiated by BMI: group I included normal body weight men (<24.9 kg / m^2), group II consisted of overweighted (25-29.9 kg / m^2) persons and group III included men with I degree obesity (≥30-35 kg / m^2).

Diagnostic findings. As a result of the analysis of the data obtained, normospermia was detected in 894 (18.31%) patients under examination. These persons average BMI was 27.28, and the their mean age was 35.25 years old.

Pathospermia was diagnosed in 3986 (81.68%) of cases. The average BMI in these men was 27.19, which did not differ significantly from normospermia (p = 0.17) group. The mean age of this group patients was 36.06 years old. Based on the Student's t-test, it was found that in pathospermia group the mean age was significantly higher (p = 0.002).

According to the parameters of dividing patients into groups by BMI, the first group included 2026 people, the second - 1372 and the third - 1482 men (Fig. 1.).

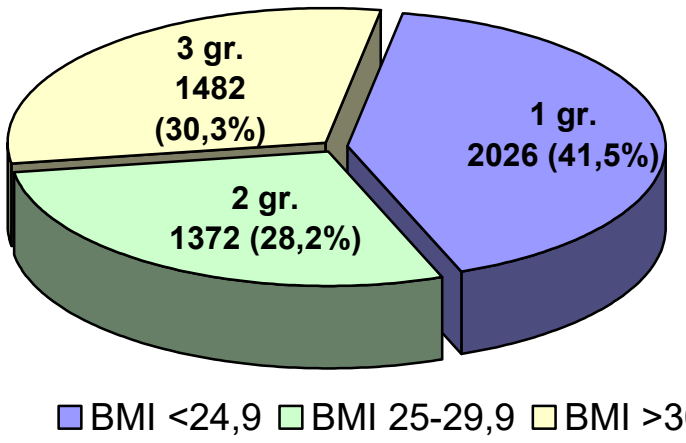

Fig. 1. Distribution of the total number of men under examination into groups depending on BMI (n = 4880)

Of 2026 (41.5%) I group patients with BMI <24.9 kg / m^2, azoospermia was detected in 355 (17.5%), oligoasthenoteratozoospermia (OATZ) - in 728 (35.9%), asthenospermia - in 539 (26.6%), normospermia - in 404 (19.9%) men.

The second group included 1372 (28.1%) persons with a body mass index 26 - 29.9 kg / m^2. Azoospermia was detected in 248 people (17.7%), OATZ - in 550 (40.0%), asthenospermia - in 331 (24.1%) people, normospermia - in 243 (17.7%) persons.

Among 1482 men with pathospermia and BMI> 30-35 kg / m^2, azoospermia was detected in 243 persons (16.4%), OATZ was detected in 611 (41.2%) persons, asthenospermia was diagnosed in 381 (25.7%)) men, normospermia was detected in 247 (16.7%) individuals (Table 1).

Table 1 - Spermogram indicators in men depending on BMI

Spermogram indicators	Group I, n =2026		Group II, n = 1372		Group III, n = 1482	
	Abs.	%	Abs	%	Abs	%
Azoospermia	355	17.6	248	18.1	243	16.4
OATZ	728	35.9	550	40.1	611	41.2
Asthenospermia	539	26.6	331	24.1	381	25.7
Normospermia	404	19.9	243	17.7	247	16.7

Analyzing the data obtained, we did not find significant changes in the frequency of azoospermia and asthenospermia occurrence and BMI increase. However, the frequency of diagnosis and the proportion of OATZ in the groups under study increased in direct proportion with BMI increase - from 35.9% in h BMI <24.9 kg / m^2 group to 41.2% in the group with BMI> 30-35 kg / m^2 (Fig. 2).

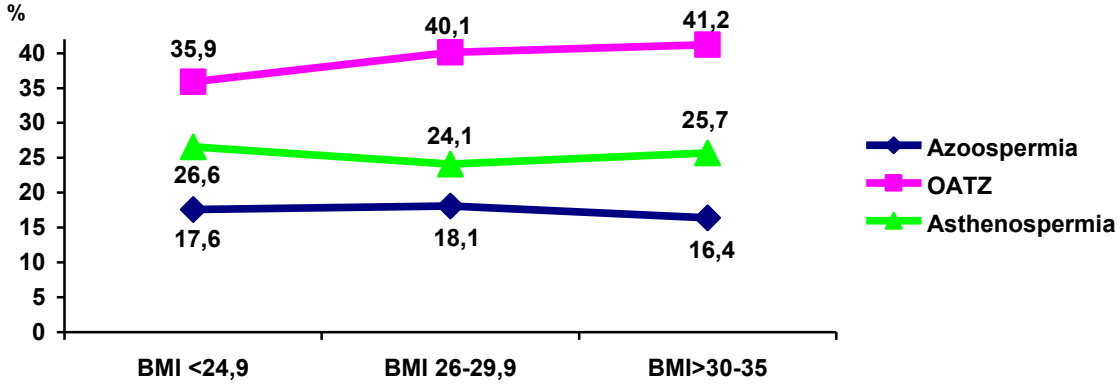

Fig. 2. Change in the frequency of pathospermia depending on BMI (%)

Conclusions. Thus, a retrospective analysis of the dependence of various types of pathospermia and BMI indicates a certain tendency for the deterioration of spermogram indicators with BMI increase.

Patients with BMI 26 - 29.9 kg / m^2 are at risk for initial decreases in spermogram indices, and this requires a detailed study of the trend revealed in the future.

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