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Medicine

OBESITY – AN ELEMENT OF METABOLIC SYNDROME

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ABSTRACT:
METABOLIC SYNDROME (MS) IS DEFINED BY LOW TOLERANCE TO GLUCOSE, DYSLIPIDEMIA, HYPERTENSION, OBESITY AND HYPERINSULINEMIA. THROUGH ALL OF THESE FACTORS MS FAVORS INCREASED CARDIOVASCULAR RISK, WHICH IS WHY IT SHOULD BE DETECTED EARLY. ALTHOUGH THESE FACTORS IN THE MS HAVE BEEN KNOWN FOR SOME TIME, THE MOST IMPORTANT IS INSULIN RESISTANCE. DUE TO INSULIN RESISTANCE, PEOPLE WITH MS HAVE A HIGH RISK OF MORTALITY DUE TO CORONARY ARTERY DISEASE.
THE CONCEPT OF MS IS AN OPEN WINDOW TO RESEARCH, A CONCEPT OPEN TO THE NEW, AN IMPORTANT TOPIC OF DEBATE IN TERMS OF ITS SPREADING AREA AND THE EVER-INCREASING GLOBAL INCIDENCE.
THE FIRST EPIDEMIOLOGICAL STUDY OF THE PREVALENCE OF OBESITY AND RISK FACTORS FOR OBESITY IN THE ADULT POPULATION IN ROMANIA WAS PUBLISHED IN 2015 AND ESTIMATED THAT 21.3% OF ROMANIANS AGED OVER 18 YEARS SUFFER FROM OBESITY.
THE TOPIC ADDRESSED IN THIS PAPER BELONGS TO A PRIORITY AREA OF PUBLIC HEALTH IN THE EUROPEAN UNION AND ROMANIA. THE MAIN PURPOSE OF THIS WORK WAS TO ANALYZE THE ASSOCIATION OF OBESITY WITH OTHER CHRONIC CONDITIONS SUCH AS: T2DM, HYPERTENSION, HYPERCHOLESTEROLEMIA, HYPERTRIGLYCERIDEMIA, DYSLIPIDEMIA, LIVER STEATOSIS, BILIARY LITHIASIS.

KEY WORDS: HYPERTENSION, METABOLIC SYNDROME, DYSLIPIDEMIA, OBESITY

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INTRODUCTION

Metabolic syndrome (MS) is defined by low tolerance to glucose, dyslipidemia, hypertension, obesity and hyperinsulinemia. Through all of these factors MS favors increased cardiovascular risk, which is why it should be detected early. Although these factors in the MS have been known for some time, the most important is insulin resistance. Due to insulin resistance, people with MS have a high risk of mortality due to coronary artery disease.

The clinical identification of MS is based on the evaluation of abdominal obesity, dyslipidemia, hypertension and glucose intolerance. Among the essential criteria of the MS, according to the WHO, insulin resistance and the estimation of insulin consumption or its substitutes play an important role.

The US National Program for Cholesterol Education proposes a more streamlined definition for clinical practice, but does not include insulin resistance. Thus, people with MS must meet three of the following criteria:

- high blood pressure (> 130 / 85mmHg)
- high plasma glucose (> 110 mg / dl)
- abdominal obesity (abdominal circumference> 102 cm in males and > 88 cm in women)
- low serum HDL-cholesterol (< 40 md/dl in men and < 50 mg/dl in women)
- elevated serum triglyceride levels (> 150 mg /dll).

The International Diabetes Federation (IDF) proposes an essential criterion for defining the MS, which is the central obesity, the values of the abdominal circumference varying within certain limits according to the characteristics of the ethnic groups of the evaluated persons. Identifying patients with MS is a practical and extremely useful way of screening patients who have multiple risk factors that predispose them to diabetes and cardiovascular disease.

The prevalence of MS in developed countries is among adult adults at around 22-39%, this percentage varying according to the criteria included in its definition. The MS is associated with future coronary events and type 2 diabetes mellitus (T2DM).

The concept of MS is an open window to research, a concept open to the new, an important topic of debate in terms of its spreading area and the ever-increasing global incidence.

The first epidemiological study of the prevalence of obesity and risk factors for obesity in the adult population in Romania was published in 2015 and estimated that 21.3% of Romanians aged over 18 years suffer from obesity.

The topic addressed in this paper belongs to a priority area of public health in the European Union and Romania. The main purpose of this work was to analyze the association of obesity with other chronic conditions such as: T2DM, hypertension, hypercholesterolemia, hypertriglyceridemia, dyslipidemia, liver steatosis, biliary lithiasis.

MATERIAL AND METHODS

The study was conducted on a group of 110 patients with different degrees of obesity admitted to the Medical Clinic II and the Department of Diabetes Nutrition and Metabolic Diseases of the Municipal Clinical Hospital of Filantropia Craiova over a period of 15 months (January 2016 - March 2017) . The study was retrospective, all the data being analyzed, being extracted from the clinical observation sheets prepared for each patient admitted to the health unit.

Reasons for hospitalization were varied, mostly in relation to cardiovascular pathology (especially hypertension). metabolic syndrome and unbalanced T2DM.

The major criterion for inclusion in the study was obesity regardless of its degree. The first data retained from the clinical observation sheets were those of a general nature: the age of the patients; sex; the residence environment. Thus, patients were divided into age groups (40-49 years, 50-59 years, 60-69 years) by gender (male / female) and by country of origin (rural / urban).

The data about the height and weight of each patient were used to calculate the body mass index, according to the formula: IMC = weight (kg): height^2 (m)

The nutritional status of each patient was assessed and their classification was made according to the degree of obesity:

- grade I obesity with BMI in the range 30-34.9 kg / m2
- grade II obesity with BMI in the range 35-39.9 kg / m2
- grade III obesity (morbid) with BMI> 40 kg / m2

Data on abdominal circumference values for the assessment of central / visceral obesity was extracted and analyzed. The baseline values for the current study were: ≥94 cm for men and ≥ 80 cm for females.

Both study groups, female and male were divided into subcategories in agreement with abdominal circumference (AC) values:

- for women: 80-84.9 cm; 85-89.9 cm; 90-94.9 cm; 95-99.9 cm; and> 100 cm
- for men: 94-99.9 cm; 100-104.9 cm; 105-109.9 cm; 110-114.9 cm and> 115 cm.

Next, I extracted anamnestic data on the existence of risk behaviors for obesity, hypertension and T2DM.

I have emphasized on food appreciation, smoking assessment, physical activity assessment (assessment of sedentary status).

Paraclinical laboratory data such as the values of the lipid profile (total cholesterol, HDL cholesterol, triglycerides), and blood glucose values were also retained. For each of these, the minimum, maximum, average values and the standard deviation were calculated.

We wanted to identify cases with hypercholesterolemia (> 200 mg/dl), hypertriglyceridemia (> 150 mg/dl) and mixed dyslipidaemia (elevated total cholesterol and triglycerides and diminished HDL cholesterol).

At the same time, the tension values were analyzed for each case, the aim being to estimate the prevalence of hypertension in obese patients. The cases already known with high blood pressure and with values kept under control by specific therapy were also retained.

Starting from the notion that obesity and insulin-resistance imply heavy hepatocyte loading, the study aims to evaluate the prevalence of hepatosteatosis in obese patients. Thus, from the data provided by the imaging investigations, we used the ultrasound assessments performed in the liver and the cholecysterase and we noted the cases with hepatic steatosis and gallstones. The status of liver steatosis was assessed for each case as being: absent, mild, moderate or severe. The liver with normal characteristics in terms of size, ecostation and homogeneity was considered devoid of hepatic steatosis. We considered the steatosis liver to be of a size above normal range and a hyperecogenic aspect compared to renal cortical, "brilliant", accompanied by posterior mitigation due to partial absorption of ultrasound by fatty tissue.

After data collection, dates were centralized statistically, being coded according to the studied variable. Once data encoding has been completed, they were entered into a database created

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in Office Excel, and the statistical analysis was performed using the SPSS 17 computer assisted program.

RESULTS

The study group comprised a total of 110 known patients with obesity of varying degrees, regardless of the subjective accusations for which they were admitted.

Of the total patient population, 67 were women and 43 men. Percentually, the female group accounted for 61% and the male 39%.

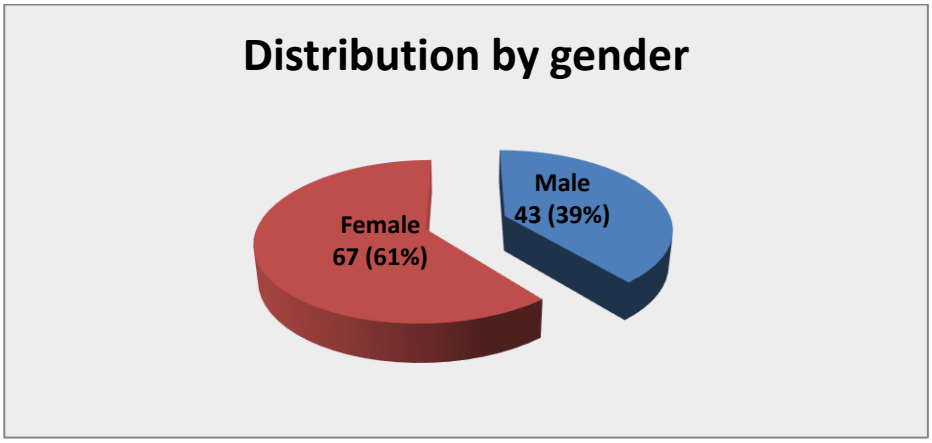

Figure 1. Distribution of cases by gender

In the general study group, 26 cases were rural (23.6%) and 84 urban (76.4%). The place of origin was studied for both the female and the male group.

Thus, in the women group, 17 cases came from the rural area and 50 from the urban area, while in the male group, 9 cases came from the rural area and 34 from the urban environment.

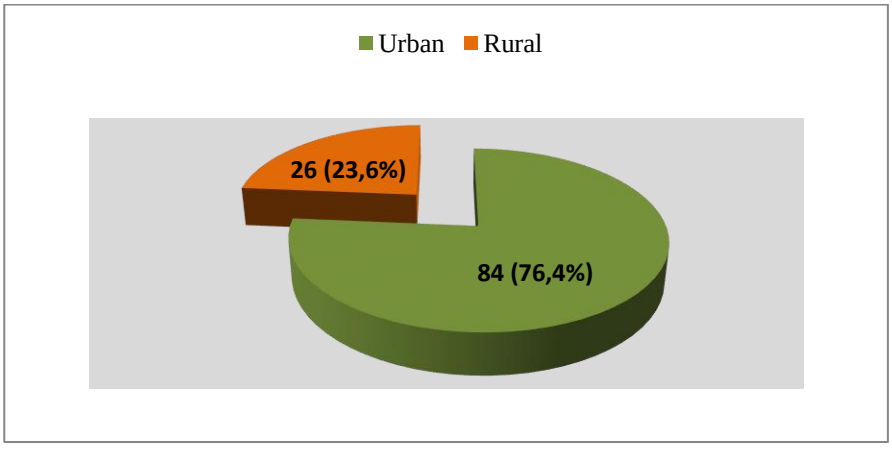

Figure 2. Distribution of cases by place of origin

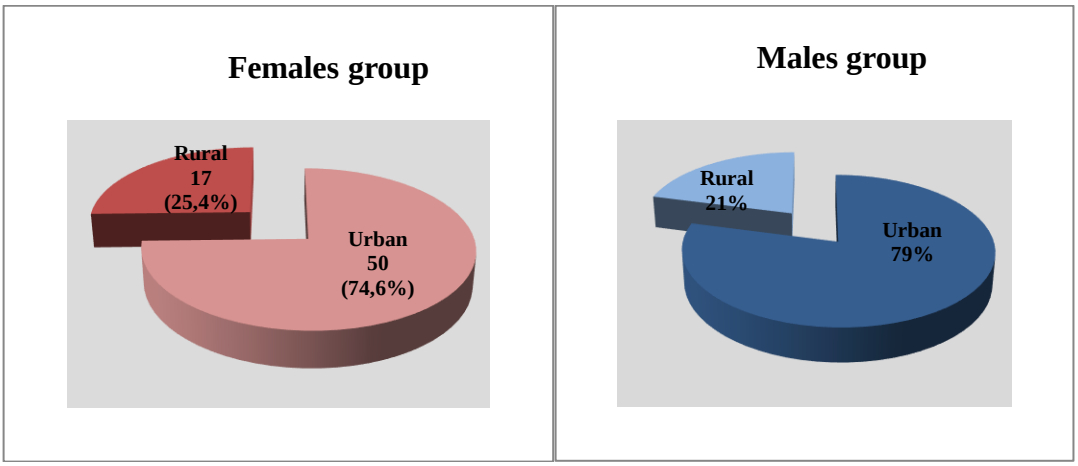

Figure 3. Distribution of cases by environment and gender

Analyzing the age of patients revealed a predominance of 40-49 year old patients in both the female and the male group.

We have established 4 age groups, namely: 30-39 years, 40-49 years, 50-59 years and 60-69 years.

In women, 7 cases were between 30-39 years of age, 34 were between 40-49 years of age, 19 were between 50-59 years of age, and 7 were aged between 60-69 years. In men, 4 cases were between the ages of 30-39 years, 21 were between 40-49 years of age, 12 were between 50-59 years of age and 6 cases were aged between 60-69 years . Thus, the analysis on the general study group comprised 11 cases aged 30-39 years, 55 cases aged 40-49 years, 31 cases aged 50-59 years and 13 cases aged 60-69 years.

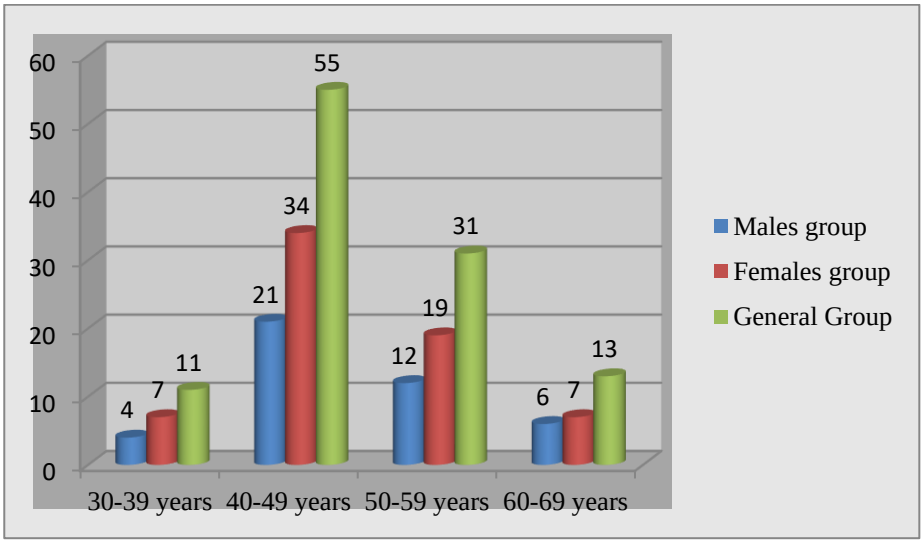

Figure 4. Distribution by age groups

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Analyzing the height and weight data from the clinical observation sheets we calculated for each case included in the study the body mass index and we made a classification (according to WHO 2000) according to the assessed nutritional status.

The lower limit of BMI for obesity was 30 kg / m2.

Cases with grade 1 obesity presented BMI values ranging from 30-34.9 kg / m2, those with grade II obesity had BMI values between 35-39.9 kg / m2 and those with Grade III obesity were characterized by BMI values above the 40 kg / m2 limit.

Grade II obesity prevailed both in the female group (49 cases, respectively 73.1%) and in the male (25 cases and 58.1% respectively). The remaining cases in the female group were divided as follows: 12 cases with grade I obesity and 6 cases with grade III obesity. In the male group, 10 cases with grade I obesity and 8 cases with grade III obesity were identified.

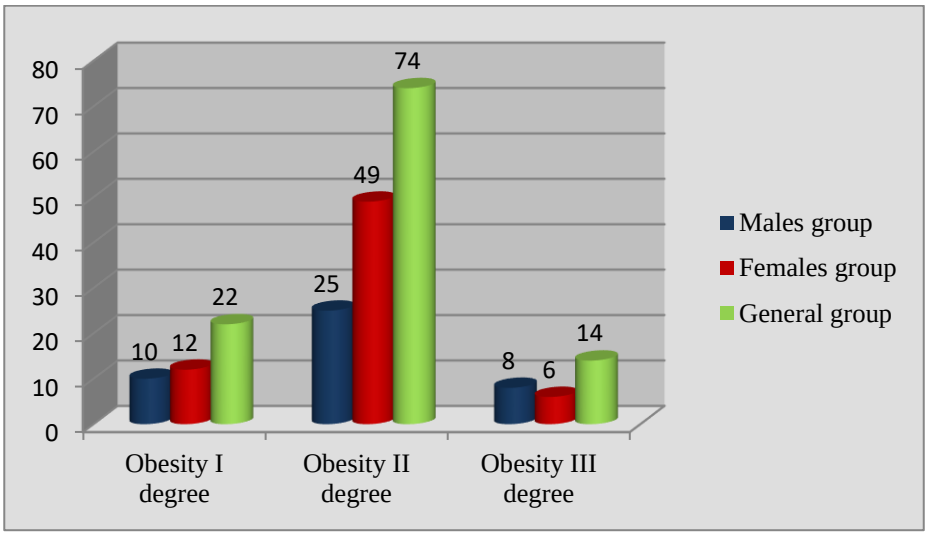

Figure 5. Distribution of cases by degree of obesity (male, female and general group)

Starting from the idea that not only quantity but also fat distribution is also a risk factor for cardio metabolic pathologies, the study looked at the analysis of the values of the abdominal circumference for each patient. According to the IDF (2009), abdominal circumference values ≥ 94 cm in men and ≥ 80 cm in women define Abdominal Obesity.

These values have been considered as reference in the current study. For both the female and the male group, 5 groups were formed in relation to the values of the AC, as follows:

- for women: 80-84.9 cm; 85-89.9 cm; 90-94.9 cm; 95-99.9 cm; and> 100 cm
- for men: 94-99.9 cm; 100-104.9 cm; 105-109.9 cm; 110-114.9 cm and> 115 cm.

In the female group, most cases (27 and 40.3% respectively) showed values of the AC in the range of 85-89.9 cm, and in the male group the most cases (12 and 27.9% respectively) showed values of AC in the range 100-104.9 cm.

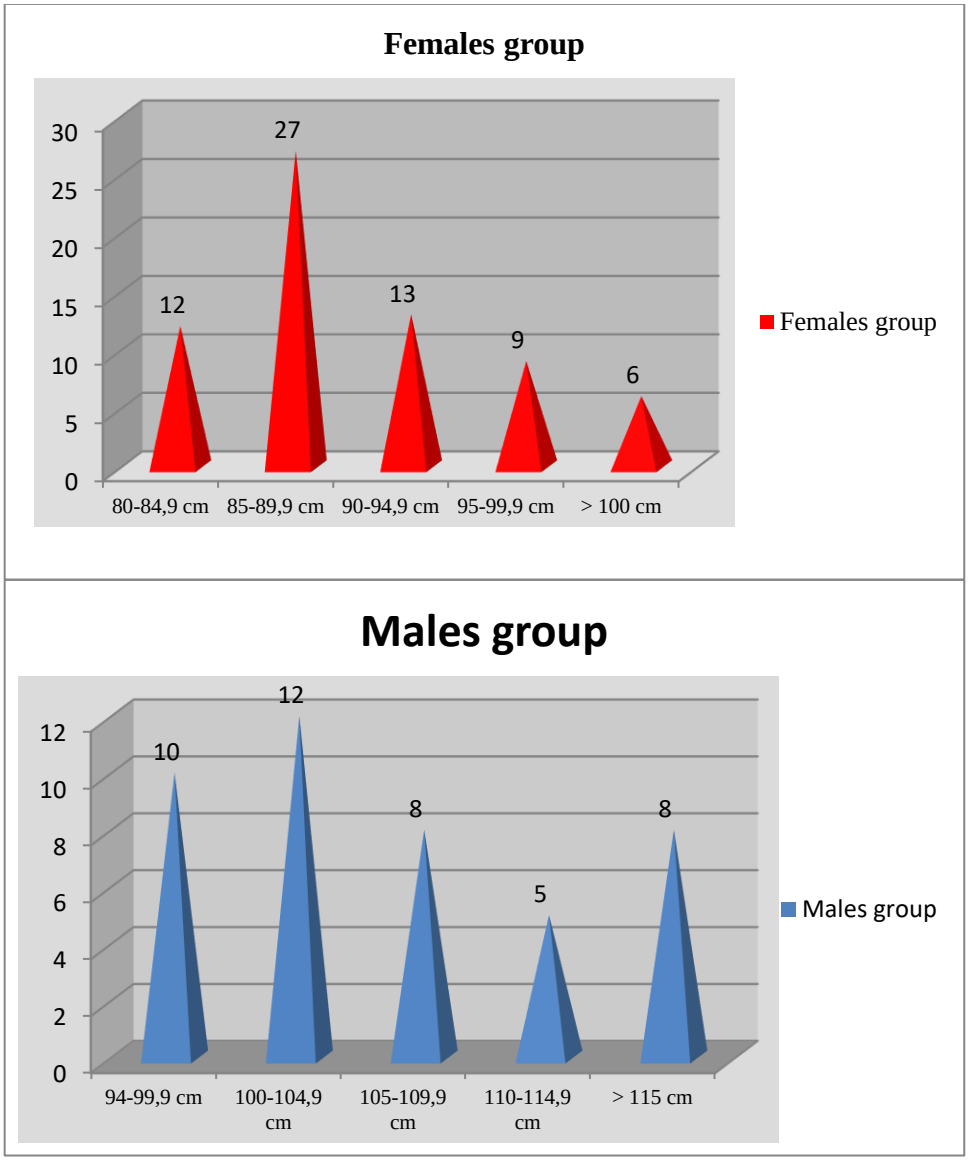

Figure 6. Abdominal circumference based on the patient's gender

In the female study group, the minimal value of the AC was 80 cm, the maximum value was 102 cm, the mean value was 89.92 cm, and the standard deviation calculated was 5.91.

In the male study group, the minimum AC was 95 cm, the maximum value was 116 cm, the mean value was 104.21 cm, and the standard deviation calculated was 6.7.

The serum total cholesterol, HDL cholesterol and triglycerides were analyzed for each case. Minimum, maximum, average, and standard deviation values were noted.

In terms of serum cholesterol values, in the female group, the mean value was 300.52 mg / dl, and in the male group it was 329.79 mg / dl.

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Table 1. Results on the analysis of the elements defining the lipid profile
Serum Total Cholesterol (mg/dl)

	Women	Males
The minimum value	215	250
The maximum value	412	420
The average value	300,52	329,79
Standard Deviation	44,4	43,87

Analyzing the following parameter, namely serum HDL cholesterol values, mean values were 48.37 mg / dL for women and 46.44 mg / dL for males.

Table 2. Results on the analysis of the elements defining the lipid profile
HDL Serum cholesterol (mg/dl)

	Women	Male
The minimum value	40	37
The maximum value	60	58
The average value	48,37	46,44
Standard Deviation	5,96	9,02

Mean values for serum triglycerides were 196.62 mg / dl in the female group and 205.53 mg / dl in the male group.

Table 3. Results on the analysis of the elements defining the lipid profile
Serum triglycerides (mg/dl)

	Women	Male
The minimum value	130	145
The maximum value	287	310
The average value	196,62	205,53
Standard Deviation	40,5	47,6

Subsequently, based on these data, we analyzed the prevalence of cases with hypercholesterolemia (serum cholesterol > 200 mg/dl), hypertriglyceridemia (serum triglycerides > 150 mg/dl) with HDL cholesterol (HDL cholesterol < 40 mg/dl for men and < 50 mg/dl for women) and mixed dyslipidemia (association of altered lipid indices) within the general study group.

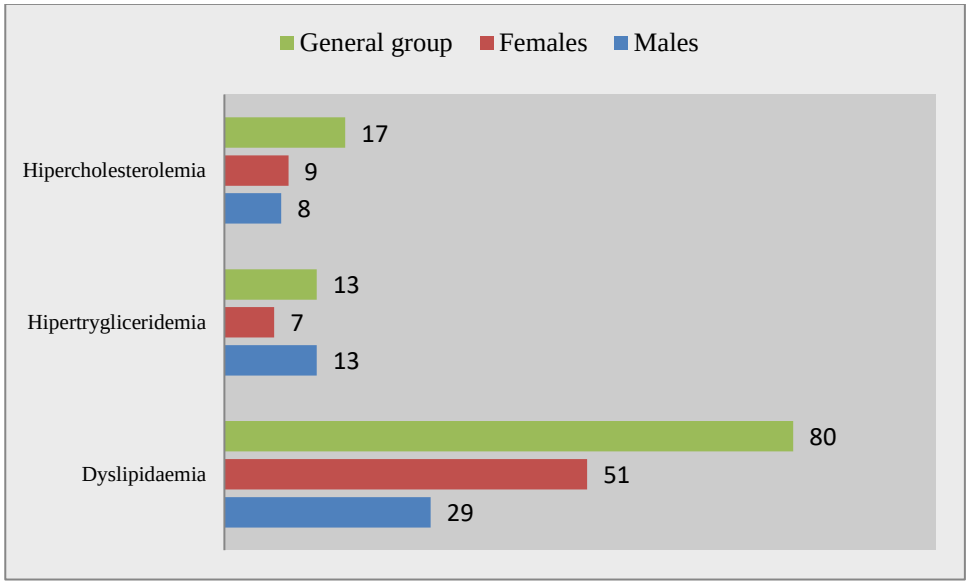

Figure 7. Changes in lipid metabolism in the female, male and general group

Therefore, the cases of mixed dyslipidemia prevailed in the female study group, where 51 cases (76.11%) and the male study group where 29 cases (67.44%) were identified. At the general batch level, the percentage for mixed dyslipidemia cases reached 72.7%.

Following the daily blood pressure values enrolled in the observation sheets of patients enrolled in the study and analyzing the medical history of hypertensive pathology, the results were as follows:

- In the female group, 55 obese patients associated increased blood pressure (above the 140/90 mmHg limit). Percentage, the recorded value was 82%.
- In the male group, 33 patients (76.7%) showed increased tensions.

It has also been taken into account that some patients have experienced normal tension, but under antihypertensive treatment. They were classified as hypertensives.

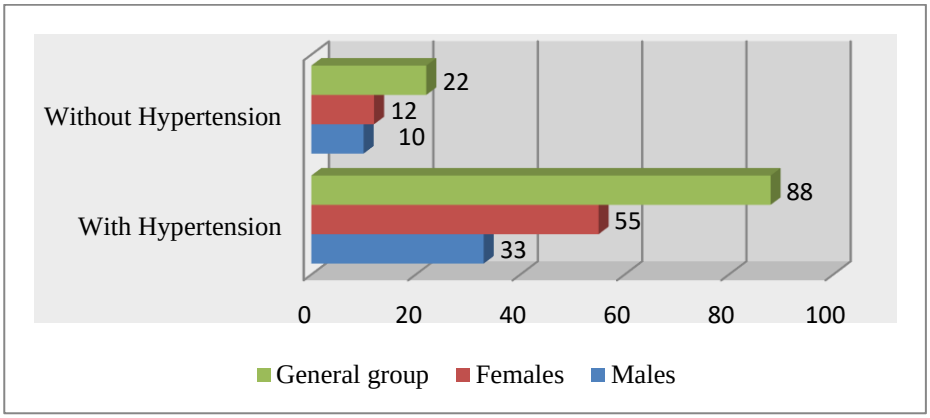

Figure 8. Analysis of the tension values in the female, male and general group

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Hypertension prevalence in the overall study group was 80% (88 out of 110). 46 patients with obesity associated high blood sugar or were known with T2DM and were treated specifically (either with orally with or without insulin). Percentage was 68.6%. Within the male group, 25 cases associated T2DM and the prevalence was estimated at 58.1% of the cases. The analysis on the general study group showed that 64.5% of cases of obesity associated T2DM.

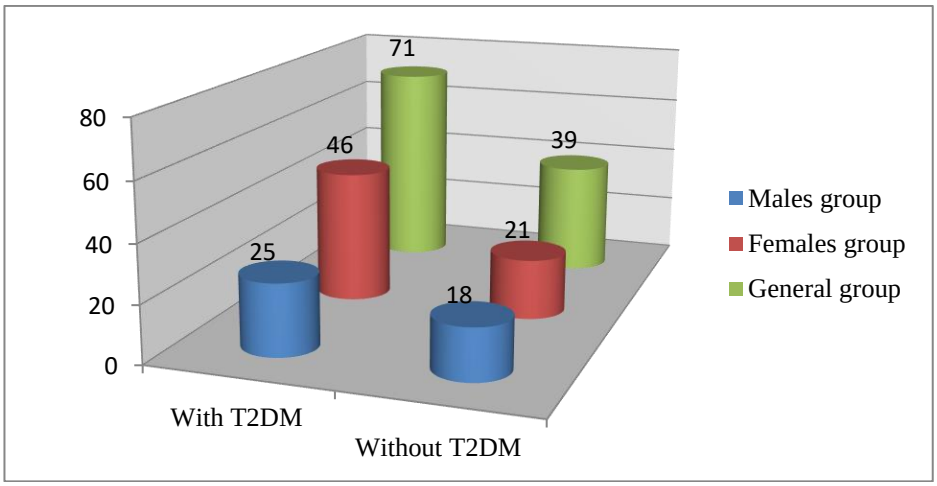

Figure 9. Analysis of blood glucose values in the female, male and general group

The results of the analysis of the study of risk behaviors for Obesity, HTA and DZ type II were obtained by analyzing the data recorded in the "behaviors" section of the clinical observation sheet. We have assessed for each case the presence or absence of behaviors considered at risk for the development of obesity, hypertension and diabetes.

The analysis focused on behaviors such as: unhealthy diet (hyper caloric, excess fat, carbohydrate and salt), smoking, sedentary

The results showed that 90% of all cases studied had one or more of the risk behaviors described above.

60 women (89.5%) and 39 men (90.6%) associated risk behaviors for developing overweight and cardio-metabolic pathologies.

55 women and 38 men with obesity have associated smoking. The overall percentage is relevant, 82% of women and 88.3% of boys associating this vice.

Unhealthy diet and sedentaryism were noted in most cases, both in the female and male bands, the overall value being 90.9% for the first parameter and 86.3% for the second.

Using data from liver ultrasound exploration, cases of obese patients were subdivided into the following categories: hepatic steatosis; with mild hepatic steatosis; with moderate hepatic steatosis; with severe hepatic steatosis.

Thus, we identified in the general study group: 6 cases of patients without steatosis-type liver disease, 20 obese patients with mild hepatic steatosis, 70 patients with moderate steatosis and 14 patients with severe steatosis.

The data correlated positively with degrees of obesity. Most cases experienced grade II obesity and moderate hepatic steatosis. The number of cases identified with grade III obesity was identical to the number of cases of severe hepatic steatosis.

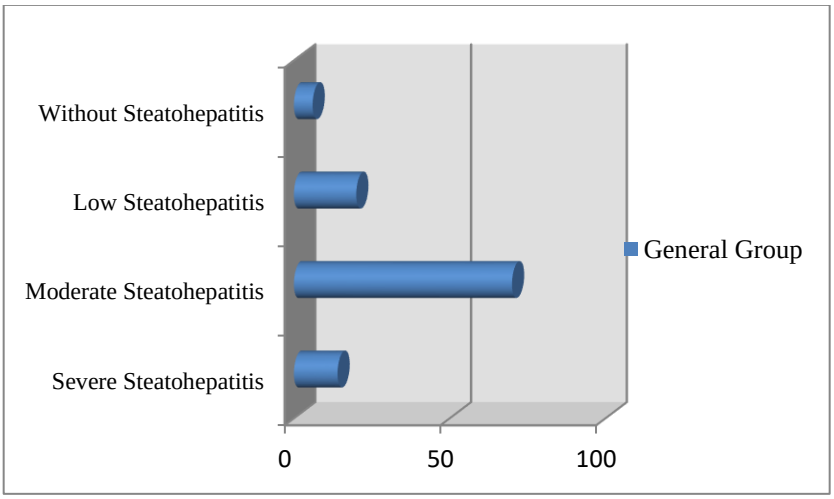

Figure 10. Analysis of steatose-type liver changes in obese patients

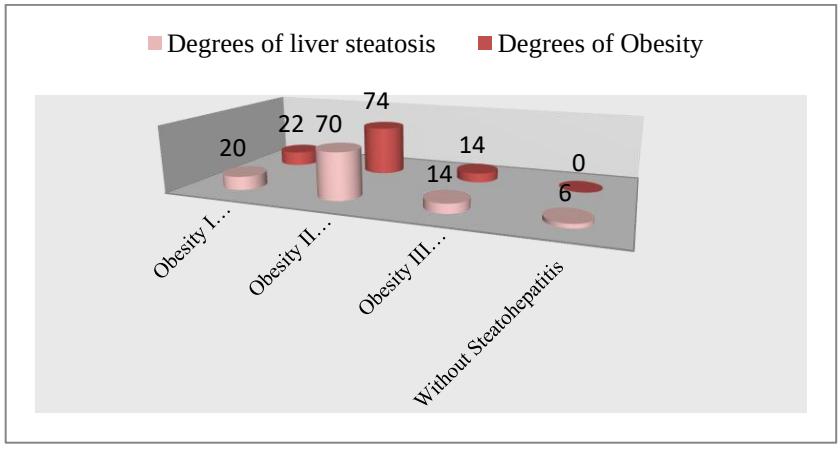

Figure 11. Correlations between obesity and the degree of hepatic impairment

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Gallstones were identified in 32.7% of the cases of obese patients enrolled in the study.

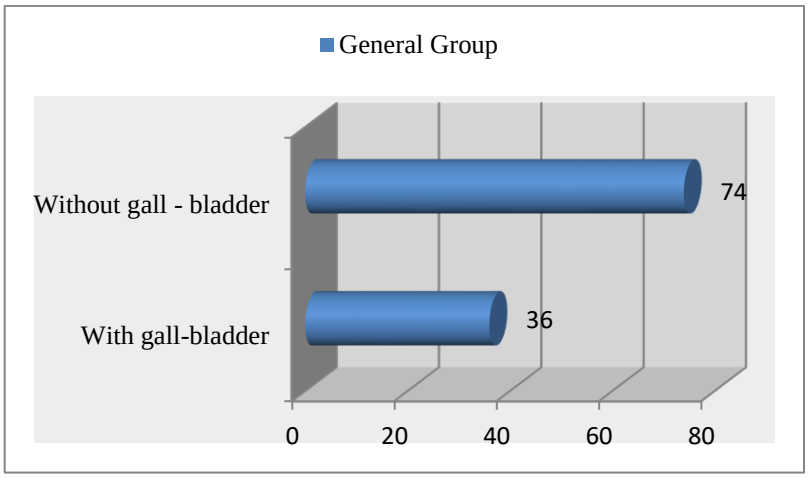

Figure 12. Results of association analysis Obesity - Gall bladder

DISCUSSIONS

Obesity is currently a pathology of epidemic proportions in most developed and developing countries.

The prevalence of obesity has grown steadily and alarmingly not only among the adult population but also in children and adolescents, a fact that is worrying for the medical world in terms of association with many cardiovascular, metabolic, osteoarticular, liver, kidney, neoplastic pathologies.

Obesity can have a significant impact on quality of life and may contribute to increased morbidity and overall mortality.

Defined as a chronic nutritional disorder, obesity is the increase in body weight due to fat, resulting from a lack of correlation between excess caloric intake and low energy expenditure. It actually translates into an excess of lipids in the body's composition by increasing the number of adipocytes but also their volume.

The main purpose of this work was to analyze the association of obesity with other chronic conditions such as: T2DM, hypertension, hypercholesterolemia, hypertriglyceridemia, dyslipidemia, liver steatosis, biliary lithiasis.

Analyzing the data from the literature, the prevalence of cases of obesity in relation to female/male sex is contradictory, depending largely on the studied region / country.

Numerous studies have shown a higher prevalence of obesity among the female population compared to the male population. However, in recent years, the trend is to equalize the percentages, the differences being not significant.

As it is known, obesity leads to numerous and important later complications, where dyslipidemia has an important place.

In the current study, serum total cholesterol, HDL cholesterol and triglycerides were analyzed for each obese patient, with the prevalence of hypercholesterolemia, hypotriglyceridemia and dyslipidemia being assessed.

Thus, cases of dyslipidemia prevailed both in the female study group (76.11%) and in the male study group (67.44%). At the general batch level, the percentage for dyslipidemia cases reached 72.7%.

Cases of hypercholesterolaemia/hypertriglyceridaemia were rarely identified in the current study group, 15.4% for hypercholesterolemia and 11.8% for hypertriglyceridemia. Dyslipidemia has numerous negative effects primarily by favoring atherogenesis[5] and implicitly by increasing the risk of cardiovascular suffering.[6]

The degree and progression of atherosclerosis is closely related to the lipid profile and thus to the dyslipidemia condition.

Lipid abnormalities in obese patients include elevated serum triglycerides, VLDL cholesterol and apolipoprotein B as well as low HDL cholesterol. Low density lipoprotein particles are considered to be highly pro-atherogenic in view of the fact that they have low affinity for the LDL receptor and thus remain in circulation for a longer period of time. In addition, they can more easily penetrate into the arterial wall than the high density particles and form linkages with the intra-arterial proteoglycans.

Last but not least, these small particles are more susceptible to oxidation, which could lead to increased absorption by macrophages.[7]

Lipid profile abnormalities encountered in obese patients are the direct cause of insulin resistance and pro-inflammatory status induced by macrophages that invade adipose tissue. An essential abnormality is the overproduction of VLDL by the liver which contributes significantly to the increase in serum triglyceride levels[8]. The rate of VLDL secretion is largely dependent on the availability of triglycerides, in turn in relation to the level of fatty acids.

Analyzing the association between obesity and the presence of type II diabetes in the patients enrolled in the study, the percentage was 64.5% in the general group and the prevalence was higher in the female group, 68.6% versus 58, 1% in men.

Data from the literature show that the development risk of type II diabetes increases significantly with weight gain. Colditz et al., In a study published in 1995, assessed the risk of developing diabetes in excess of adipose tissue in 11,421 women. The results showed that for a weight gain of 5-9.9 kg the relative risk of developing diabetes is 1.9% and for a weight gain of 8-10.9 kg the relative risk is 2, 7%.[9]

In line with this observation, several studies have shown that weight loss is associated with a significant reduction in the risk of type II diabetes.

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In a prospective 20-year study of 7,176 British men, the prevalence of diabetes cases was 11.4 per 1000 subjects among obese subjects and only 1.6 per 1,000 people in normal weight subjects.[10]

In the case of obese patients already known with type II diabetes, it has been shown that weight reduction is associated with better disease control.

This has been noted in the results of several studies, including the AHEAD (Action for Health in Diabetes) study, a randomized study of lifestyle intervention[11].

Starting from the idea that obesity can underlie the development of various cardiovascular pathologies, in the present study we have been looking at the prevalence of cases of hypertension in the 110 patients enrolled in the study.

In the general group we identified 88 cases (80% prevalence) with HTA, and the prevalence was differentiated by 82% in the female group and 76.7% in the male. Frequent association of obesity with high blood pressure and cardiovascular disease of atherosclerotic etiology has been reported more than 50 years ago. Recent advances in adipose tissue biochemistry have provided evidence of biochemical mechanisms involved in such associations.

Adipose tissue infused with monocytes has been shown to be an autocrine and endocrine organ, releasing pro-inflammatory cytokines, such as adiponectin and leptin. An increase in mRNA expression for 11β hydroxyteroid dehydrogenase and for hexose-6 phosphate dehydrogenase was detected in the adipose tissue of obese women, resulting in an acceleration of the synthesis of cortisol and aldosterone.

Adipose tissue also contains components of the renin-angiotensin-aldosterone system, with an increase in angiotensin II generation in obese adipose tissue, leading not only to increased blood pressure, but also to the development of oxidative stress and inflammation[12], and the decrease consecutive adiponectin production would contribute to resistance to insulin. Excessive free fatty acids in the circulation inhibit nitric oxide synthase and implicitly the production of relaxation factor derived from endothelium, a mechanism that could contribute to the occurrence of high blood pressure.[13]

Several studies have shown positive association between obesity and development of hypertension, cardiac arrhythmias (especially atrial fibrillation)[14], angina pectoris, congestive heart failure, myocardial infarction, stroke[15]

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One of the most representative studies of the association between obesity and cardiovascular risk was the Framingham study, conducted on 5209 subjects[16].

The data provided by the follow-up of subjects for 30 years demonstrated the clear difference between the risk of cardiovascular disease development in obese patients (78.8%) compared to the same risk in non-weighted patients (54.8%).[17]

The SEPHAR study, the study of the prevalence of hypertension and the risk assessment of cardiovascular risk in Romania, was conducted in 2005 and tracked a lot of 2017 subjects over the age of 18 years. The data provided by this studio showed that the prevalence of primary hypertension in obese subjects is very high - 54.1% (52% in the female group and 58% in the male group), significantly higher than the prevalence of the same pathology in normoponderal[18].

Analyzing the prevalence of digestive complications associated with obesity, the current study analyzed the liver and cholecystic echographic structure and made assessments of the degree of liver steatosis and the presence / absence of biliary lithiasis.

Thus, in the general group we identified moderate hepatic steatosis at 63.6%, and biliary lithiasis in 32.7% of the cases studied. Moreover, degrees of hepatic steatosis (mild, moderate and severe) correlated positively with the degree of obesity identified in patients.

Out of 22 patients with grade I obesity, 20 experienced mild hepatic steatosis; of 74 patients with grade II obesity, 70 had moderate hepatic steatosis, and 14 patients with grade III obesity had severe hepatic steatosis.

Data from the literature signals differences in the visceral adipose tissue function compared to subcutaneous adipose tissue.

Subcutaneous adipose tissue is the major source of leptin and adiponectin, and is also more susceptible to insulin action. Visceral adipose tissue is more susceptible to adrenergic stimuli that lead to increased lipolysis and the release of non-esterified fatty acids that reach the liver through the portal vein.

Most proinflammatory cytokines such as tumor necrosis factor alpha, interleukin 6 as well as angiotensinogen and plasminogen activator inhibitor mostly originate from visceral adipose tissue[19].

Excess free fatty acids and proinflammatory cytokines in the portal circulation in association with hyperinsulinism lead to lipid loading of the liver and stimulation of liver synthesis of lipoproteins and proteins.

Regarding the association of obesity-lymphocyte biliary, as previously stated, in the current study, 32.7% of obese patients presented biliary calculus images on ultrasound examination.

Data from literature shows that obesity is a risk factor for this digestive pathology [20]. Cholesterol production accounts for over 80% of all cases of biliary lithiasis. Obesity is an important risk factor in cholesterol formation by cholesterol overloading of the bile and decrease

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in bile vesicle motility. There is a linear correlation between the body mass index (BMI) and the risk of biliary litiation, so a woman with a BMI of 45 kg / m2 has a 7-fold higher risk of developing biliary calculi than a woman with BMI less than 24 kg / m2. [21] Numerous studies support the important role of abdominal obesity in lithogenesis through the increased insulin resistance of abdominal fat. Tsai et al. Established a significant correlation between abdominal obesity index (abdominal circumference, waist-to-hip ratio) and increased cholecystectomy in women (waist / hip ratio = 0.86, RR = 1.39, 1.66, p & lt; 0.0001), independent of IMC (42). Calcification of the waist> 102.6 cm in males determined a relative risk of 2.29 (95% CI 1.69-3.11, p <0.0001) of symptomatic biliary lithiasis versus those with a circumference <86.4 cm[22].

CONCLUSIONS

♣ Obesity is an important public health problem, with increasing prevalence and multiple complications, especially with increased frequency of dyslipidemia, type 2 diabetes and hypertension.

♣ In Romania, the prevalence of metabolic syndrome is estimated at 44%, 43% among men and 45% among women.

♣Metabolic syndrome is associated with increased risk of a variety of pathologies including diabetes mellitus, peripheral arterial disease, non-alcoholic liver steatosis, polycystic ovary syndrome, biliary lithiasis, asthma, articular degenerative disease, depression, sleep apnea syndrome and some forms of cancer (prostate, breast, endometrium, colorectal).

♣ The current concept of adipose tissue is that it is an organ that mediates specific functions such as conserving energy reserves, hormone secretion and an immune role. In obesity there is an increase in fat mass, especially by increasing the size of fat cells, although their number can be increased especially in obese childhood onset individuals.

♣ Obesity determines insulin resistance is a pathological condition characterized by a suboptimal response of peripheral tissues to the action of insulin.

♣ Generally viewed, the metabolic syndrome is a cumulative risk factor that includes central obesity, hyperglycemia, atherogenic dyslipidemia and elevated blood pressure.

♣ The study was retrospective, with the case studies of 110 obese patients, and the data used were taken from the clinical observation sheets.

♣ Female lot represented 61% and male 39%, half of patients aged 40-49 years and 76.4% with urban residence.

♣ Mixed dyslipidemia prevailed both in the female study group (76.11%) and in the male study group (67.44%). At the general batch level, the percentage for mixed mixed dyslipidemia cases reached 72.7%.

♣ 64.5% of patients enrolled in the study had T2DM, the prevalence being higher in the female group, 68.6% compared to 58.1% in males.

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♣ In the general group we identified 88 cases (80% prevalence) with HTA, and the prevalence was 82% in the female group and 76.7% in the male.
♣ We identified moderate hepatic steatosis in 63.6% of the cases studied.
♣ The degrees of hepatic steatosis (mild, moderate and severe) correlated positively with the degree of obesity identified in patients.
♣ Obesity is an important risk factor in the formation of cholesterol calculi by cholestrol overloading of the bile and the decrease in bile duct motility. In the current study we identified biliary lithiasis in 32.7% of the analyzed cases.

COMPLIANCE WITH ETHICS REQUIREMENTS. The authors declare no conflict of interest regarding this article.
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