

STATISTICAL CORRELATIONS BETWEEN OBESITY AND THE RISK OF DEVELOPING CARDIOVASCULAR DISEASES IN PEOPLE AGED 50 AND OVER IN MUREȘ COUNTY

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Abstract: Our work hypothesis: To establish statistical correlations between obesity, sex, age, dyslipidemia and the risk of cardiovascular diseases in people over the age of 50. **Materials and Methods:** We questioned 108 subjects from Mureș county, situated in rural and urban zones, healthy and with diverse pathologies during the year 2015. Our data was processed using Medcalc and Microsoft Excel. **Results:** The correlation of sex, age and obesity resulted in: of 54 (50,00%) subjects between 60-69 years old, 46 (85.18%) had a Body Mass Index (BMI)>30; of those 46 subjects, 37 (80,43%) were females and 9 (19,56%) were males with the age between 60-69. **Conclusions:** We consider necessary to develop more efficient health education community programmes aimed at risk groups, through monitoring and informing about a healthier and balanced lifestyle with the aim of reducing cardiovascular diseases.

INTRODUCTION

Gaining weight is associated with a higher risk of developing coronary diseases, strokes and type 2 diabetes; this risk is higher depending on BMI. In Romania overweight population is estimated to be between 30-36% in adult population and 20-25% for obese population.(1)

AIM

Establishing correlations between age, sex, residence (urban and rural), lifestyle and hemodynamic status in a group of adults from Târgu-Mureș in order to evaluate the risk for diverse cardiovascular diseases.

MATERIALS AND METHODS

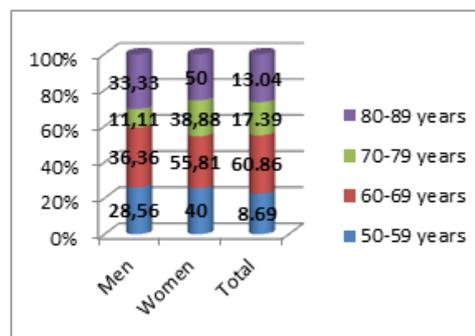
To accomplish our objective, we conducted a randomized study in 2017, on a group of 108 subjects, males and females, who agreed to fill out our evaluation questionnaire and had recent lab results. The subjects were sorted in four groups: 50-59 years, 60-69 years, 70-79 years and 80-89 years, from rural and urban areas, healthy and with diverse pathologies.

We selected patients from these age groups because they are representative of the prevalence of cardiovascular pathology in our county. In the investigated group we followed results related to: residence, age, sex, obesity, BMI, systolic blood pressure, lab results (cholesterol, LDL and HDL cholesterol, triglycerides). To obtain this data we used a questionnaire made up of 24 questions. The types of questions used in the questionnaire were as followed: opened questions, closed questions (dichotomous, ranked questions, and with choices), control type questions, direct and indirect questions. The data obtained using this questionnaire was included in a database which was saved in a table-like format, statistically processed with Medcalc and Microsoft Excel and the results were interpreted using Medcalc and then reported to criteria pertaining to sex, age and the risk for the subject to develop certain cardiovascular diseases.

RESULTS

Regarding the correlation age-sex-obesity we had the following results: 46 (42.59%) subjects with BMI>30: 37 (80.43%) female subjects and 9 (19.56%) male subjects. The distribution of obese 46 (42.59%) subjects related to BMI, age and sex can be seen in figures no. 1 and 2.

Figure no. 1. Distribution of obese subjects based on sex and age



The highest incidence of obesity (BMI>30) along our subjects is along the 60-69 years range – 28 (60.86%) subjects, female subjects being 37 in number.

From the 50-59 years range there were 7 men of whom 2 (28.56%) men were obese and out of the total of 5 women 2 (40.00%) women were obese as well. From the 60-69 years range out of the total of 11 men, 4 (36.36%) men were obese, and of 43 women, 24 (55.81%) women were obese. From the 70-79 years range there were 9 men of whom 1 (11.11%) man was obese and from the total of 18 women only 7 (38.88%) women were obese. And lastly, from the 80-89 years range, out of the total of 6 men, 2 (33.33%) men were obese and out of the total of 8 women, 4 (50.00%) women were obese.

The correlation between total cholesterol serum – age – sex can be seen in table no. 1.

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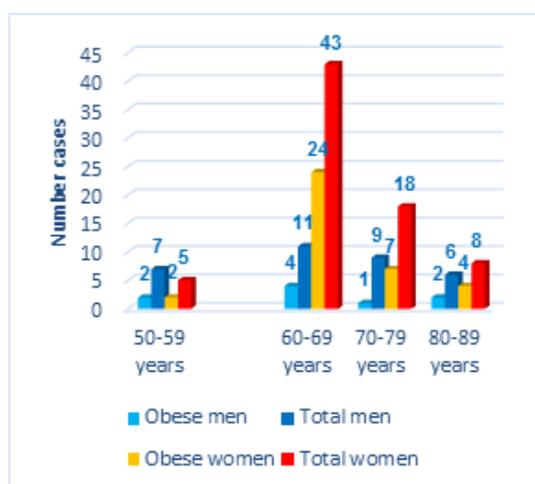
Table no. 1. Distribution of subjects based on total cholesterol serum

Age Group (years)	251-300 (mg/dl)			>300 (mg/dl)		
	Men Nr. (%)	Women Nr. (%)	Total Nr. (%)	Men Nr. (%)	Women Nr. (%)	Total Nr. (%)
50-59	1 (100%)	-	1 (12.50%)	-	-	-
60-69	-	6 (85.71%)	6 (75.00%)	-	-	-
70-79	-	1 (14.28%)	1 (12.50%)	1 (50.00%)	-	1 (50.00%)
80-89	-	-	-	1 (50.00%)	-	1 (50.00%)
Total	1 (12.50%)	7 (87.50%)	8	2 (100.00%)	-	2

Table no. 2. Systolic blood pressure (BP) values (mmHg) based on age and sex

Age group (years)	Systolic BP values									Total cases
	140-159 mmHg			160-179 mmHg			>180 mmHg			
	Male Nr/%	Female Nr/%	Total Nr	Male Nr/%	Female Nr/%	Total Nr	Male Nr/%	Female Nr/%	Total Nr	
50-59	-	-	-	-	-	-	-	-	-	-
60-69	5 (71.42)	9 (40.90)	14	1 (33.33)	2 (66.67)	3	-	3 (60.00)	3	20
70-79	1 (4.54)	5 (22.72)	6	-	-	-	-	-	-	6
80-89	1 (4.54)	1 (4.54)	2	-	-	-	2 (40.00)	-	2	4
Total	7 (31.81)	15 (68.18)	22	1 (33.33)	2 (66.67)	3	2 (40.00)	3 (60.00)	5	30

Figure no. 2. Distribution of obese subjects based on sex and age



In the case of total cholesterol serum, the highest value were in women aged 60-69 years old with a number of 6 (85.71%) subjects having total cholesterol serum values between 251-300 mg/dl, which in our opinion can be the consequence of general metabolic disturbances and lipid metabolism especially in the context of menopause and post-menopause which predispose to hypercholesterolaemia and obesity.

The calculated values of LDL cholesterol reported towards age and sex can be observed in the 60-69 years old represented by women interval mostly with a percentage of 75% with LDL cholesterol values between 151-200 mg/dl.

Regarding the correlation of sex-age-HDL cholesterol out of the 18 subjects (16.66%), 4 (28.57%) subjects were females aged between 60-69 years old.

Regarding triglycerides levels in our group, 19 subjects have elevated values. From this group: 14 subjects (73.68%) have triglycerides levels between 151-200 (mg/dl) and

5 subjects (26.31%) have triglycerides values >200 (mg/dl).

The correlation between triglycerides-sex-age show the following: 10 subjects (52.63%) are females with 8 subjects (80.00%) aged between 60-69 years old and triglycerides levels between 150-200 mg/dl and 2 subjects (20.00%) have triglycerides values >200 mg/dl with ages ranging between 50-59 years old and 80-89 years old: 9 subjects (47.36%) are men of whom: 6 subjects (66.66%) have triglycerides values between 150-200 mg/dl with age ranging between 50-59 years old, 70-79 years old and 3 subjects (33.33%) have triglycerides values >200 mg/dl and ages ranging between 50-59 years old, 70-79 years old, 80-89 years old.

Measurements of systolic BP based on the age and sex of subjects can be see in table no. 2.

The interpretation of the results has been made on a group of 30 (27.77%) subjects (who had values over the normal limit) of whom: 20 (66.66%) female subjects and 10 (33.33%) male subjects.

From this group: 22 (73.33%) subjects had systolic BP values between 140-159 mmHg; 3 (10.00%) subjects had systolic BP values between 160-180 mmHg; 5 (16.66%) subjects had systolic BP > 180 mmHg.

The correlation between ages – sex – systolic blood pressure show the following: women aged between 60-69 years old: 9 subjects (40.90% of 22 cases) with systolic BP between 140-159 mmHg; 2 subjects (66.67% from 3 cases) with systolic BP between 160-179 mmHg; 3 subjects (60.00% from 5 cases) with systolic BP values over 180 mmHg; between 70-79 years old: 5 subjects (22.72% from 22 cases) with systolic BP values between 140-159 mmHg; between 80-89 years old: 1 subject (4.54% from 22 cases) with systolic BP values between 140-159 mmHg; men: between 60-69 years old: 5 subjects (22.72% from 22 cases) with systolic BP values between 140-159 mmHg, 1 subject (33.33% from 3 cases) with systolic BP values between 160-179 mmHg; between 70-79 years old: 1 subject (4.54% from 22 cases) with systolic BP values between 140-159 mmHg; between 80-89 years old: 1 subject (4.54% from 22 cases) with

systolic values between 140-159 mmHg, 2 subjects (40.00% from 5 cases) with BP values >180 mmHg.

DISCUSSIONS

From our study and our database obtained using the questionnaire regarding the correlation between sex-age-obesity we can observe a higher frequency of obese (BMI>30) 37 female subjects (80.56%) aged 60-69 years old. From our point of view we can attribute this correlation to hormonal changes pertaining towards women at that age, specifically 60-69 years, suffering from menopause or post-menopause which modify the homeostasis of the organisms control system and can be predisposed to obesity as said by Andreu Palou and Luisa Bonet (2) in their study.

The results of our study about the correlations specified above can be compared with the global trend from Seravalle and Grassi's (3) study about adults with a BMI over 25 kg/m² that shows an increase from 28.8% for men and 29.8% for women in 1980 to 36.9% for men and 38% for women in 2013, while Selthofer and Relatic K (4) sustain that 39% of adults in the whole world are overweight with a BMI over 25 kg/m² and 13% with a BMI of over 30 kg/m². Comegna et al (5) in their study about the incidence of obesity in the UK depending on sex, age and race, show a prevalence of obesity in women exactly like in our study compared to other countries: in the USA, 33.9% of women, in Turkey 34.1%, 38% of black women from Africa and 46% of black women in the UK.

Cholesterol in people aged 60 and above (in our study women aged 60-69 years) is a strong predictor of cardiovascular diseases and obesity as said by Wilbert (6) in his study. And in the case of total serum cholesterol, high values in women aged 60-69 years in our opinion can be the consequence of metabolic disturbances and of the lipid metabolism especially due to menopause and post menopause which can predispose to hypercholesterolemia and obesity.

The increase of LDL cholesterol with aging (ideal LDL <100mg/dl) can also predispose to the increase in the risk of developing metabolic and cardiovascular diseases with the increase of coronary atherosclerosis, heart attacks and valvular diseases. This increase can be attributed to a low activity lifestyle specific to elderly patients. In generally, the prevalence of the metabolic syndrome especially in females (based on our results) increases with age, as sustained also by Wahid et al. (7) in their study. According to them the highest prevalence in the world is in the US in approximately 60% of women aged 45-49 and 45% of men aged 45-49 compared to our study where the prevalence of an increased LDL cholesterol level is higher in women aged 60-69 years and men aged 70-79 years. From the results obtained regarding the correlation between age-sex-HDL cholesterol we can observe that with aging, the level of HDL cholesterol also rises (normal values >40 mg/dl), in females aged 60-69 and a 70-79 a HDL cholesterol level of >60mg/dl can have a protective role against the occurrence of vascular and coronary atherosclerosis as stated by Trajkovaska et al.(8) With the increase of age the triglyceride levels also increase which in turn increase the risk of atherosclerosis and cardiovascular diseases in individuals over the age of 50 in men and over the age of 60 in women. This observation is confirmed by the study of Budoff (9) who also agree that higher levels of triglycerides are a cardiovascular risk biomarker but they rather have a pathogenic atherosclerotic role and provide solid evidence that triglycerides and triglyceride rich lipoproteins are the cause of atherosclerotic cardiovascular disease and have a pathogenic role as well as LDL cholesterol. The results of our study are in correlation with the results reported in the article published by Quarat et al (10). They show that in the study conducted by

Kayani et al, it was demonstrated that the age groups in which triglyceride/HDL cholesterol ratio is correlated with the risk of atherosclerosis and cardiovascular disease are 50-59 years in males and 60-69 years in women.

Distribution of the batch by age group shows that the highest incidence was among women and men in the age group 60-69 years with measured tension values of 140/90 mmHg systolic blood pressure increasing in proportion to the age of the subjects. Age increase (50 years) predisposes these subjects to the occurrence of high blood pressure, which confirms the intrinsic link between advanced age-arteriosclerosis and hypertension; this observation is confirmed by the study of Seravalle and Grassi.(3)

CONCLUSIONS

The increase in age correlated with obesity, dyslipidemia increase the risk of vascular atherosclerosis and cardiovascular and metabolic diseases.

We support the importance of a more effective community and educational intervention in risk groups to support a balanced lifestyle that involves a healthy, plant-based rich diet, no smoking, daily physical activity, avoiding a sedentary lifestyle and training family doctors to prevent obesity and other non-communicable diseases of the inflammatory type.

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