

# Influence of Body Weight on the Biochemical Indicators in Menopause

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## ABSTRACT

**Introduction:** One of the problems of today and probably this century is obesity, which is classified by the WHO as a disease. **Material and methods:** We performed a prospective cross-sectional study of the body weight impact on certain biochemical indicators in menopausal women living in the municipalities Cazin and Velika Kladusa. **Results and discussion:** The study included 334 women aged 40-60 years, who had regular medical examinations. For each patient at the beginning of the study we measured: body mass index, total cholesterol values, LDL, HDL and triglycerides fractions. Our findings indicate an increase in total cholesterol, LDL fraction and triglycerides in patients with increased body mass index, without statistical significance. Values of HDL fraction were significantly decreased with increasing body mass index.

**Keywords:** body mass index, biochemical indicators, menopause.

## 1. INTRODUCTION

The term obesity means abundant accumulation of fat in the body. Obesity is diagnosed when body weight exceeds the ideal weight for more than 20%. Severe pathological changes that affect almost all systems can be expected only when the relative body weight is over 50% from ideal. Obesity occurs especially in the preceding phases of menopause, when there is declining physical of women (1). It was found that obesity is more common in poorer than the rich, because their diet is directed toward foods that are cheaper and have a higher energy value. It should be noted that the dominant type of obesity is *alimentary obesity*, as a result of a positive energy balance. In obese patients, the levels of cholesterol, triglycerides and lipoproteins in the blood are increased (2). Obesity is positively correlated with the occurrence of many diseases, such as hypertension, atherosclerosis, and thrombosis of the heart and brain blood vessels.

Obesity is a chronic disease that takes epidemic proportions and according to the WHO becoming a leading public health problem. Alarming data suggest that in the developed countries obesity affects nearly one-third of the adult population and one fifth of children.

## 2. GOALS

Determine existence of statistically significant difference in the concentration of total cholesterol, LDL, HDL fractions and triglyceride levels in patients with normal body mass index compared to patients with increased body mass index (BMI).

## 3. STUDY DESIGN AND METHODOLOGY

We conducted a prospective cross-sectional study for a period of one year in the municipality of Cazin and Velika Kladusa. The study included 334 women aged 40-60 years of age, which had regular medical examinations. For each patient at the beginning of the study we measured the body mass index, total cholesterol values, LDL, HDL fractions and triglycerides.

We divided the sample into three groups according to body mass index:

- Patients with a normal BMI (21.5 to 25.6 kg/m<sup>2</sup>)
- Patients with increased BMI (25.7 to 30.5 kg/m<sup>2</sup>)
- Patients with markedly increased BMI (> 30.5 kg/m<sup>2</sup>)

After collection obtained values of the observed variables are processed with the statistical software SPSS for Windows (Statistic 21). From the statistical models we used one-way analysis of variance.

## 4. RESULTS

The average age of the patients was 51.75 ± 6.83 years.

Table 1 shows the mean values of the observed variables in all three groups of patients. Data in Table 2 indicate a statistically significant decrease in HDL cholesterol in patients with increased body mass index.

Figure 1 shows the mean values of the observed variables in relation to body mass index. The results of our study suggest an increase in cholesterol, LDL and triglycerides in patients with increased body mass index. HDL values are statically significantly decreased with the increase of body mass index.

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
						Lower Bound	Upper Bound		
Cholesterol	BMI 21.5 - 25.6	87	5.801	1.3884	.1489	5.505	6.096	3.1	10.8
	BMI 25.7 - 30.5	119	5.901	.9600	.0880	5.727	6.075	3.4	8.5
	BMI >30.6	128	5.909	1.1115	.0982	5.714	6.103	3.7	9.7
	Total	334	5.878	1.1392	.0623	5.755	6.000	3.1	10.8
HDL	BMI 21.5 - 25.6	73	1.845	.8308	.0972	1.651	2.039	.5	4.2
	BMI 25.7 - 30.5	104	1.788	.7881	.0773	1.634	1.941	.6	4.1
	BMI >30.6	103	1.510	.7198	.0709	1.369	1.651	.3	5.4
	Total	280	1.700	.7865	.0470	1.608	1.793	.3	5.4
LDL	BMI 21.5 - 25.6	73	3.323	1.1828	.1384	3.047	3.599	.6	6.1
	BMI 25.7 - 30.5	102	3.526	1.0107	.1001	3.328	3.725	.4	6.6
	BMI >30.6	103	3.549	1.0600	.1044	3.342	3.756	1.1	6.5
	Total	278	3.481	1.0765	.0646	3.354	3.609	.4	6.6
Triglycerides	BMI 21.5 - 25.6	83	1.511	1.0347	.1136	1.285	1.737	.3	6.5
	BMI 25.7 - 30.5	116	1.670	.9094	.0844	1.503	1.837	.5	5.9
	BMI >30.6	125	1.823	.9358	.0837	1.657	1.989	.4	5.7
	Total	324	1.688	.9580	.0532	1.583	1.793	.3	6.5

Table 1. Arithmetic mean of the observed variables tested in our sample

		Sum of Squares	df	Mean Square	F	Sig.
Cholesterol	Between Groups	.704	2	.352	.270	.763
	Within Groups	431.428	331	1.303		
	Total	432.132	333			
	Total					
HDL	Between Groups	6.057	2	3.029	5.038	.007
	Within Groups	166.517	277	.601		
	Total	172.574	279			
	Total					
LDL	Between Groups	2.502	2	1.251	1.080	.341
	Within Groups	318.528	275	1.158		
	Total	321.030	277			
	Total					
Triglycerides	Between Groups	4.926	2	2.463	2.712	.068
	Within Groups	291.489	321	.908		
	Total	296.415	323			
	Total					

Table 2. ANOVA test of the observed variables tested in our sample

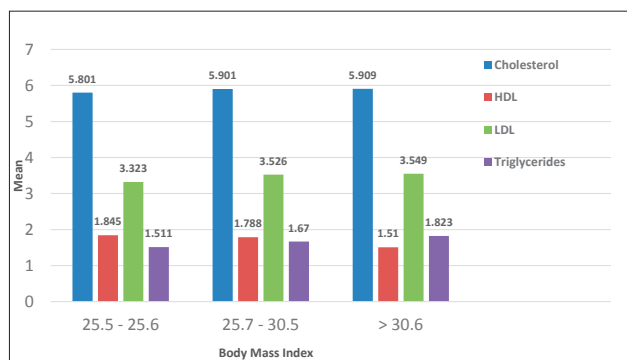


Figure 1. Arithmetic mean of the observed variables tested in our sample

### 5. DISCUSSION

Overweight is most commonly a result of excessive food intake and energy and lack of physical activity. It is associated with various diseases, particularly cardiovascular diseases, type

2 diabetes mellitus, obstructive apnea, certain types of cancer, osteoarthritis and asthma. The most serious cardiovascular disorders begin as metabolic syndrome, and cause about 50% of deaths in the developed (Western) countries and greatly reduce the quality of life (3).

The most common causes of death in our country, as well as in the developed countries are diseases of the heart and blood vessels. On their development overweight has a number of effects. As overweight is more expressed the greater are the risks of developing diseases of the heart and blood vessels. Fat concentrated in the abdomen is much more dangerous for the development of cardiovascular disease than fat concentrated in the thighs, and the risk of developing the disease is precisely proportional to the ration of thigh and abdomen circumference (4).

Overweight eventually causes high blood pressure because poorly vascularized adipose tissue creates greater resistance to blood flow towards the periphery, and the requirements for the heart as a pump increased with every physical exertion. It is noted that the obesity is associated with ovarian cancer, as well as breast cancer in postmenopausal women. This is probably related to a larger amount of active estrogen in the blood, which can derive from a less active to more active in the adipose tissue in the abdomen (5). In obese persons are relatively common also gallbladder cancers and cancers of the liver and pancreas.

Therefore, the obesity itself should be viewed as a disease and its treatment as prevention of various diseases (6). However, in spite of everything, obesity is now only nominally considered as a disease. Usually the most normal procedure is to use expensive drugs or procedures to treat the consequences of obesity, and that obesity itself is not treated as such, or if patients are not referred to its treatment but it is left to the patient's decision (7). As a consequence of obesity occur many diseases—from diabetes, gallstones and blood vessel disease to some malignancies.

As a result of all above it is believed that obesity shortens life span (8). Obesity is preventable by proper and balanced diet and regular physical activity. Today, we are all aware of how menopausal women in their fifties need individualized advice in terms of prevention of disorders with heterogeneous nature that are associated with menopause.

## 6. CONCLUSIONS

The results of our study suggest an increase in cholesterol, LDL and triglycerides in patients increased body mass index. HDL also significantly decreased with the increase in body mass index. We recommend changing habits in these patients as a first measure in the prevention and treatment of obesity. It is believed that a healthy diet and regular exercise provide long-term health. This lifestyle helps to reduce the risk of cardiovascular diseases and osteoporosis. We recommend choosing foods with low concentration of saturated fatty acids and cholesterol.

**Conflict of interest: NONE DECLARED.**

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