

EFFECTS OF LIFESTYLE ON CHOLESTEROL AND BLOOD SUGAR LEVELS

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Abstract: Increased levels of cholesterol and blood sugar are public health problems that are increasingly important, because they cause micro and macro complications. In order to prevent this condition, terms of modifying the style of life and eating habits need to be changed. This paper has determined the way in which the effect of a lifestyle reduces cholesterol and blood sugar levels, with a particular emphasis on the effect that diet and modern lifestyle have on diabetes, that is, on the increase in cholesterol levels. The aim of the paper is to highlight problems that arise from increased levels of cholesterol and blood sugar, but also to present possible solutions to these problems, or to improve the condition of patients. The research was carried out on a sample of 80 respondents from the Republic of Srpska, where the respondents were divided into two groups (experimental group and control group). Respondents from the experimental group had, before and after a 30-day application of a health diet, measured values of cholesterol and blood sugar.

Key words: cholesterol, blood sugar, lifestyle, nutrition.

INTRODUCTION

Cholesterol and elevated blood sugar are one of the leading problem of today. Cholesterol is a special type of lipid that differs from its other lipids matter in its structure. It is a necessary part of the organism, and it is a part of all cells in the human organism, and it is the original substance for the synthesis of some hormones, vitamin D and bile acids. The origin of cholesterol in the body is twofold, and most cells produce cholesterol alone, and the other way is through the foods we enter. The relationship between these two ways of producing cholesterol is as follows: 2/3 of cholesterol is produced by synthesis, while only 1/3 is entered into the human body through food. Considering that the body produces cholesterol in large quantities, it is enough to enter about 150-300 mg of the cholesterol per day. The blood cholesterol is transmitted by binding lipoproteins, which are divided regarding density: LDL or low-density lipoprotein („bad“ cholesterol) and HDL or high-density lipoprotein („good“ cholesterol). The current recommendation for the total blood cholesterol values are the blood cholesterol levels less than 5.0 mmol/L. The recommended value of „good“ or HDL cholesterol should be at least 1.0 mmol/L, while the recommended value of „bad“ or LDL-cholesterol should be less than 3.0 mmol/L. In the Institute of Medicine report, it is recommended that cholesterol consumption be reduced by eating less (Kanter et al., 2012). An elevated amount of sugar (more than 6.7 mmol/L in the morning, on an empty stomach or more than 11.1 mmol/L during the day) in the blood indicates the presence of diabetes mellitus. Diabetes can be manifested in two types: Type I diabetes and Type II diabetes. It is much more difficult to diagnose Type II diabetes, and it is often unnoticed. It is assumed that about 50% of those with this type of diabetes are undetected at any time, but during this time the disease continues to cause damage, gradually and quietly. Blood sugar levels, however, may be below the permitted levels due to: liver disease, excessive alcohol consumption, reduced sugar intake, etc. Symptoms that indicate that are upset, sweating, headache, vague vision, behavioral disorders, reduced concentration. The ideal amount of blood sugar is from 3.8 to 6.1 mmol/L. When it comes to the style of life and diet, they can contribute to a large extent in the appearance of elevated cholesterol and blood sugar (Goldberg et al., 1998; Nathan et al, 2005). Increased blood sugar and LDL cholesterol are associated with an increased risk of microvascular and macrovascular complications, and their reduction reduces the risk

of these complications. Regulating nutrition and improving lifestyle can significantly contribute to the treatment of these diseases. European guidelines widely recommend diets, weight-counseling exercises in patients with diabetes (Nathan et al., 2006). Many short-term randomized clinical trials have shown that intense lifestyle interventions can lead to a reduction in blood sugar and cholesterol levels (Anderson et al., 2003; Boden et al., 2005; Lima Ribeiro et al., 2015).

METHODOLOGY

SUBJECTS

A total of 80 subjects from several towns from the Republic of Srpska took part in the research. The age of the subjects ranged from 18 to 88 years. Men and women with high cholesterol and sugar levels were also involved in the study.

METHODS

The study was conducted for a period of 30 days. Cholesterol and blood sugar samples were divided from 80 selected subjects. Subjects were divided in two groups: experimental and control group. In each of these groups there were 40 subjects. The experimental group consisted of 25 male examinees and 15 females, while the control group consisted of 15 male examinees and 25 females. Subjects from the experimental group were explained how harmful are the effect of fat food, smoking and alcohol, as well as physical inactivity. They were asked to respect diet food for the purpose of this research, and after 30 days the values cholesterol and blood sugar were measured. The collected data were entered into a specially created database. For numerical data, the mean arithmetic value, minimum and values are calculated. The consent was obtained from the subjects for the use of data in the research. Subjects from the control group received recommendations to increase physical activity by 30%, while subjects from the experimental group received a special diet plan based on consuming only foods without fat of animal origin, primarily cereals, fruits and vegetables, as well as with adequate increase in physical activity from 30-45 min daily.

RESULTS

At the start of the study, the mean cholesterol value in the control group for men was 5.87 mmol/L, and for women 5.17 mmol/L. In the experimental group, the average cholesterol value for men was 6.15 mmol/L, and for women 5.54 mmol/L (Chart 1).

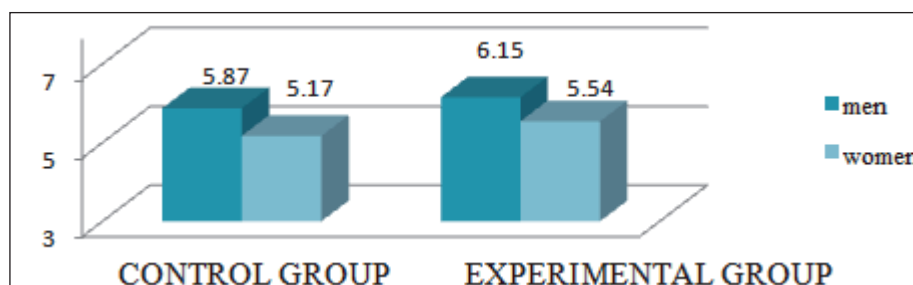


Chart 1. The average values of cholesterol (mmol/L) at the beginning of the study in relation to the gender (control and experimental group)

At the beginning of the study, the mean blood sugar level in the control group for men was 6.19 mmol/L, and for women 6.59 mmol/L. In the experimental group, the mean blood sugar level for men was 7.13 mmol/L, and for women 6.58 mmol / L (Chart 2).

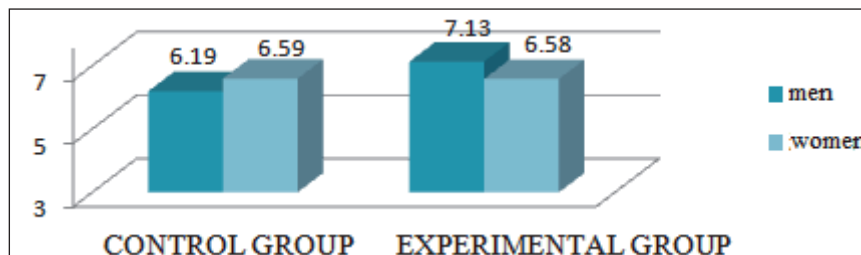


Chart 2. The average blood sugar (mmol/L) at the beginning of the study in relation to gender (control and experimental group)

Therefore, if we observe the measured values at the beginning of the study that is, the samples taken in relation to the gender, it comes to the conclusion that the results are equal. The nearest value of the samples taken from the experimental group, the value of the control is when measuring blood sugar of the female subjects.

At the end of the study, the average blood sugar level in the experimental group was 5.60 mmol/L for men, and 5.21 mmol/L for women. In the control group, the average blood glucose at the end of the study for men was 5.85 mmol/L, and for women 6.27 mmol/L. The mean blood sugar values (mmol/L) at the beginning and at the end of the study in relation to the gender (control and experimental group) are summarized in Chart 3.

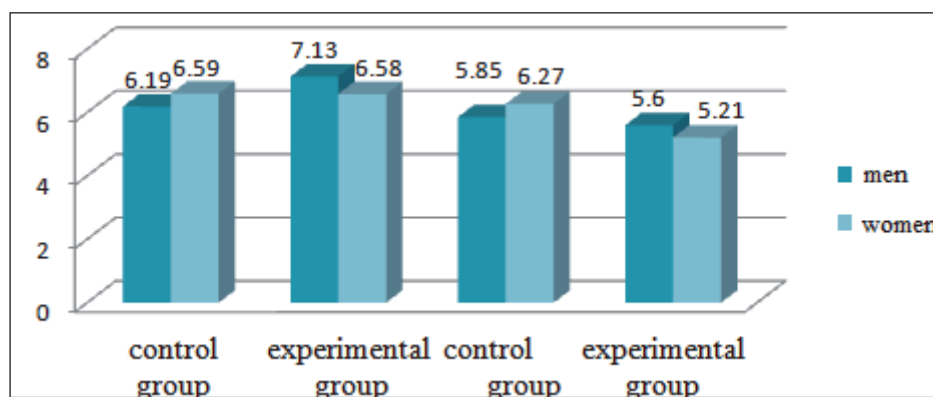


Chart 3. The average blood sugar (mmol/L) at the beginning and at the end of the study in relation to gender (control and experimental group)

At the beginning of the study, the mean blood sugar level for men in the experimental group was 7.13 mmol/L, while at the end it was 5.60 mmol/L, while the median value for women was 6.58 mmol/L and for 15 days fell to 5.21 mmol/L. In the control group, the results are somewhat weaker and at the beginning of the study, the mean blood sugar level for men was 6.19 mmol/L, while at the end it was 5.85 mmol/L. At the beginning of the study, the median value for women was 6.59 mmol/L and at the end of the study that value dropped to 6.27 mmol/L (Chart 3).

At the end of the study, the average cholesterol value in the control group for men was 5.8 mmol/L and for women 5.1 mmol/L. In the experimental group, the average cholesterol value for men was 5.4 mmol/L and for women 5.1 mmol/L (Chart 4).

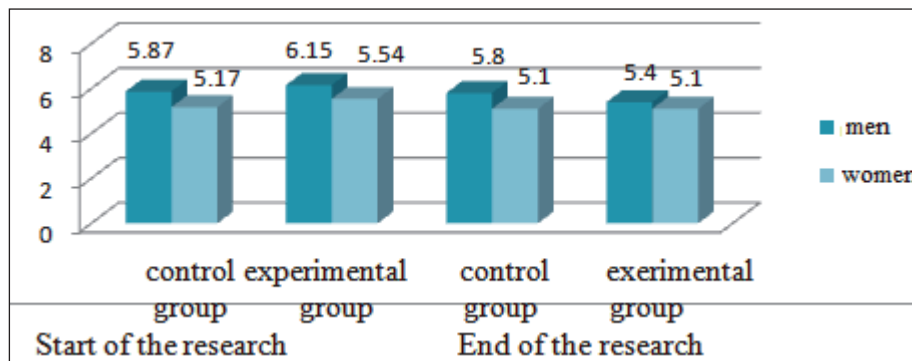


Chart 4. Average values of cholesterol (mmol/L) at the beginning and at the end of the study in relation to gender (control and experimental group)

After changing habits and lifestyle, the same subjects were re-measured cholesterol, this time their results were better than the results of the control group. So even based on such a short period it can be concluded that only a little regulation of a diet and lifestyle habits can raise the cholesterol levels.

At the start of the study, the mean cholesterol level for men in the control group was 5.87 mmol/L, while at the end it was 5.8 mmol/L. At the beginning of the study, the median value for women was 5.17 mmol/L and after 15 days was 5.1 mmol/L. These changes are not statistically significant. Subjects from the experimental group had statistically significant changes in the level of cholesterol, so after 15 days the value for men of 6.15 mmol/L dropped to 5.4 mmol/L and for women the value of 5.54 mmol/L, dropped to 5.1 mmol/L (Chart 4).

Thus, by eating quality food, adapted to the condition of our organism, and also managing a proper life, without consuming alcohol, nicotine, doing regular daily exercise and trying not to be exposed to excessively stressful situations, a person can, without any remedies, solve the problem of cholesterol and blood sugar.

If we compare the measured values from the beginning and the end of the study, we see that the results are optimal. The total measured value of cholesterol at the beginning of the study was 5.52 mmol/L for the control group (which continued with the usual diet and usual lifestyle habits), while at the end of the study it was 5.45 mmol/L.

DISCUSSION

From the results of the study, it can be seen there were not statistically significant changes in blood sugar and cholesterol in the control group at the end of the 30-day study. The subjects from the experimental group had statistically significant reductions in cholesterol and blood sugar. The values at the beginning and the end of the study decreased by 0.07 mmol/L.

In the experimental group, the reduction was significantly higher, total values were 5.84 mmol/L, and at the end of the study, they were 5.25 mmol/L; the values were less at the end of the study by 0.59 mmol/L or 10 %. A similar situation was found in the blood sugar values, a decrease in the value at the end of the study relative to the onset of the same, in the control group was 0.33 mmol/L (at the beginning of the study total values were 6.39 mmol/L, and at the end 6.06 mmol/L).

On the other hand, the measured values of all subjects at the beginning of the study was 6.85 mmol/L in the experimental group, and at the end these values decreased by 1.45 mmol/L, which was 5.4 mmol/L. Observed in percentages, blood sugar has been lowered, after introducing proper nutrition and changing lifestyle by 21% (Chart 5 and Chart 6).

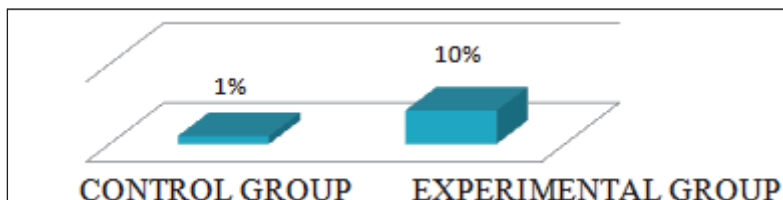


Chart 5. Percentage of falling cholesterol values

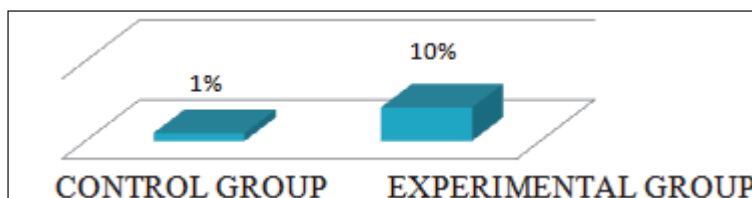


Chart 6. Percentage of falling blood sugar

CONCLUSION

It is concluded that the 30-day nutrition program proved successful in reducing total cholesterol and blood sugar. It has been established that the level of cholesterol and blood sugar significantly decreased in subjects who used a balanced diet of herbal foods. In this study, it has been shown that consuming regulated nutrition gives visible results if people are motivated to accept these methods. Simple measures of determining the level of cholesterol and blood sugar, as well as health promotion, and nutrition programs can effectively influence the stopping of growth and the gradual decline in morbidity and mortality from elevated cholesterol and blood sugar parameters. Educational programs are the most important measures that health workers can apply to reduce morbidity and mortality caused by lipid raising in the blood.

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