

## ABSTRACT

**Introduction:** In recent years, there has been a significant and sustained increase in the incidence of the type II diabetes mellitus. The cause of this phenomenon lies in the inappropriate lifestyle of the population living in economically developed countries. Type II diabetes mellitus is one of the main risk factors for cardiovascular disease, which is the most common cause of death in diabetics.

**Objectives:** The aim of this study was to investigate the effect of regular nutritional intervention on selected factors influencing cardiovascular risk in type II diabetic patients, more specifically on weight, BMI, amount of fat and muscle mass, waist circumference, WHR, HbA1c, smoking abstinence and blood pressure. In addition, the aim was to ascertain how the resulting change in the factors of interest would vary with the frequency of the intervention, as well as the adherence of type II diabetics to treatment. The outcomes of patients who completed the series of interventions were also compared with those who did not complete the interventions. The success rate of the intervention in patients was also compared according to their gender and age. The final objective was to determine whether the changes achieved in each of the factors studied would be sustained by patients after a 3-month follow-up, when no further intervention would take place.

**Methods:** Data collection took place in the ResTrial diabetes clinic at Zhořelecká 514/2 in Prague 8. The study included 14 new patients of the diabetes outpatient clinic who started nutritional intervention between January 2, 2023 and March 30, 2023. Baseline data on weight, body composition, BMI, waist circumference, WHR, HbA1c, smoking abstinence and blood pressure were obtained. The same data were analysed after 3 months, during which time patients attended consultations with a nutritional therapist at intervals of 3–4 weeks, for a total of 4 nutritional education sessions. Data on weight, BMI, HbA1c and blood pressure were again assessed after another 3 months without intervention. The same data were evaluated in a control group of patients who received only the initial nutritional intervention, this group consisted of 13 patients of which 1 failed to attend the follow-up measurement after 6 months. The data obtained were then statistically processed and evaluated.

**Results:** After 3 months, during which 4 nutritional interventions were carried out, the patients of the study group had a reduction of HbA1c by 9.75 ( $\pm 9.15$ ) mmol/mol, weight reduction by 4.86 ( $\pm 3.9$ ) kg, reduction of BMI by 1.64 ( $\pm 1.2$ ) kg/m<sup>2</sup>, reduction of waist circumference by 4, 25 ( $\pm 3.89$ ) cm, a decrease in WHR by 0.015 ( $\pm 0.02$ ), a decrease in body fat by 3.38 ( $\pm 2.05$ ) kg, a decrease in muscle tissue by 0.85 ( $\pm 1.57$ ) kg, a decrease in systolic blood pressure by 8.75 ( $\pm 14.45$ ) mm Hg and a decrease in diastolic blood pressure by 8.13 ( $\pm 5.14$ ) mm Hg. There was no change in the amount of cigarettes smoked. In the control group, three months after the initial education, there was a reduction in HbA1c by 8.3 ( $\pm 14.47$ ) mmol/mol, a reduction in weight by 1.96 ( $\pm 3.3$ ) kg, a reduction in BMI by 0.72 ( $\pm 1.19$ ) kg/m<sup>2</sup>, and a reduction in waist circumference by 1.92 ( $\pm 2.27$ ) cm, a decrease in WHR of 0.008 ( $\pm 0.04$ ), a decrease in body fat of 3.28 ( $\pm 3.19$ ) kg, an increase in lean body mass of 0.77 ( $\pm 1.19$ ) kg, a decrease in systolic blood pressure of 11.25 ( $\pm 11.55$ ) mm Hg and a decrease in diastolic blood pressure of 6 ( $\pm 10.17$ ) mm Hg. The amount of cigarettes smoked increased by 2 cigarettes per day in one patient. After a three-month follow-up, when both groups of patients were already free of nutritional intervention, there was no statistically significant improvement or deterioration in any of the monitored parameters. Of the study population, only 8 patients completed the three-month follow-up, which is 57 %. There was no statistically significant correlation of the change in individual parameters with the age of the patients, except for a moderate negative correlation of age with the percentage change in the amount of adipose tissue, i.e., the higher the age of the patient, the lower the loss of adipose tissue. When comparing the results of women and men, it appeared that the more significant improvement in most parameters occurred in the female group. When comparing the results of the group of patients who completed the

series of nutritional interventions with the group of patients who did not complete the programme, statistically significant differences were found in almost all parameters. Patients who completed the programme had significant improvements in most of the parameters monitored, while those who did not complete the programme had no significant improvements in the parameters monitored and in some parameters even worsened compared to the initial measurement.

**Conclusion:** Research has shown that nutritional intervention in patients with diabetes mellitus type 2 has been shown to improve individual parameters that influence cardiovascular risk. The group of patients who received nutritional intervention once a month showed a greater improvement in most of the parameters studied than patients who received only initial nutritional intervention. However, the study population was too small to draw a general conclusion and it would be useful to follow-up this research with a larger cohort of patients and include assessment of changes in other factors affecting cardiovascular risk such as cholesterol levels, 6-minute walk test, qualitative and quantitative dietary assessment, etc.

## **KEYWORDS**

type II diabetes mellitus, cardiovascular risk, obesity, diet, nutritional intervention