

ABSTRACT

The topic of the diploma thesis is the influence of a low-carbohydrate diet on the treatment of type 1 diabetes mellitus. It is an autoimmune disease for which it is necessary for patients to administer insulin. The selection of suitable sports activities, good health and mental condition and, above all, the adjustment of eating habits also contribute to the successful compensation of diabetes. This work demonstrates a low-carbohydrate diet as one of the possibilities diabetics can eat. The work is divided into two parts, theoretical and practical.

The theoretical part briefly describes the disease and presents the recommended and a low-carbohydrate diet. The following section also addresses physical activity. It describes the issues of sports for people with diabetes who are on a regular diet, as well as on low-carbohydrate diet.

The practical part shows the results of glucose sensors (Free Style Libre, Dexcom G6 and Medtronic), which continuously measure blood sugar levels. In the practical part, eight respondents with type 1 diabetes, who switched the recommended diet for a low-carbohydrate diet, were surveyed in the form of a questionnaire. The purpose of the questionnaire was to assess the effects of switching to a low-carbohydrate diet on: the compensation of diabetes; the frequency of hypoglycemia; insulin consumption; and also the management of sport activities.

Another component of the practical part was a comparison of basic indicators of diabetes compensation and laboratory values of blood lipids in a total number of ten patients on a low-carbohydrate diet (the eight mentioned above and two others, who switched to a low-carbohydrate diet after being diagnosed with diabetes). To illustrate the management of diabetes by this type of diet, the work also provides examples of curves from continuous measurement of glucose (glucose sensors), which shows the effects of food, administered insulin and physical activity on the glycemic response.

The graphs and respondents' answers show that a low-carbohydrate diet could contribute to the overall compensation of diabetes. On average, the glycated hemoglobin decreased from 63 mmol/mol to 42 mmol/mol in the subjects. The determinative deviation averaged 1.4 mmol/l. On average, diabetics spent 89% of the time in the required range of 3.9 - 10 mmol/l. Hypoglycemia occurred in less than 2% of the total time. The glycemic value averaged 5 mmol/l. There was no increase in blood lipids in the subjects. The total amount of insulin was decreased by half after switching to a low-carbohydrate diet. It was shown that diabetics on a low-carbohydrate diet do not have a problem with hypoglycemia during physical activity, and doing sports is not an obstacle for them

keywords: diabetes mellitus type 1, recommended diet, low-carbohydrate diet, physical activities with diabetes, insulin, glycemia, compensation of diabetes