

## **Abstract:**

**Introduction:** Osteoporosis is a systemic metabolic skeletal disease characterized by a decrease in bone mechanical resistance due to decreased bone mass and/or bone quality defects. The incidence of osteoporosis has been increasing in developed countries. The reason for this is a lifestyle change in terms of a decrease in physical activity and an increase in life expectancy, which is also related to an increase in the number of people with type 2 diabetes mellitus. Type 2 diabetes mellitus is the most common metabolic disease characterized by insulin resistance, insulin deficiency and hyperglycaemia. Type 2 diabetes mellitus and osteoporosis often occur together. Some authors consider osteoporosis to be a chronic complication of type 2 diabetes.

**Objective:** The objective of this thesis is to evaluate dietary habits and intakes of selected nutrients in postmenopausal women with type 2 diabetes mellitus (DM2) and compare this with recommended values and with control group of women without type 2 diabetes mellitus, and to assess possible relationships to the risk of osteoporosis and fractures.

**Methods:** Dietary habits and intakes of selected nutrients were evaluated on the basis of questionnaires and an analysis of three-day dietary plans. Energy, essential nutrients, fiber, sodium, calcium and phosphorus were mapped using a nutritional software Nutriservis Profesional. Bone density and body composition parameters were measured by dual energy X-ray absorptiometry (DXA).

**Results:** Dietary analysis showed that there was no statistically significant difference in nutrient intake between the studied groups. However, both groups consume excess fat, saturated fatty acids, sodium and phosphorus. Intakes of fiber and proteins, especially its plant-based forms, are insufficient. Calcium intake is also insufficient, which is caused by low consumption of milk and dairy products. In addition, a DM2 group exercises less, spends less time walking during a day and does less outdoor activities. The higher probability of major osteoporotic fracture and fracture of the proximal femur was found in the DM2 group (medium and high risk) compared to the control group (low and medium risk). BMD values are comparable. The neck of the femur is most affected, the total femur is least affected. Despite the same percentage of body fat, DM2 patients have a higher ratio of android to gynoid distribution of body fat compared to the control group.

**Conclusion:** Inadequate eating habits, hyperglycaemia and an excessive accumulation of the end products of glycation contribute together to disorders of bone metabolism and higher risk of fractures in patients with type 2 diabetes mellitus. For these patients it is therefore necessary to ensure a sufficient intake of calcium and proteins with an equal distribution of proteins from animal and plant sources, and to reduce the intake of fats, saturated fatty acids, sodium and phosphorus. It is also necessary to emphasize the importance of regular physical activity, which contributes to a reduction of the risk of osteoporotic fractures, a better control of type 2 diabetes mellitus, and a prevention of diabetic complications.

**Keywords:** osteoporosis, type 2 diabetes mellitus, dietary habits, risk factors