Abstract:

Introduction: Osteoporosis belongs to multifactorial metabolic skeletal disease. The breast carcinoma is one of the most common malignities in women worldwide (with an exception of skin tumours). Postmenopausal women with non-metastatic breast carcinoma, which are treated with aromatase inhibitors (AI), have increased risk of developing osteoporosis. In these patients, it is necessary to identify the factors contributing to onset of osteoporosis which can be influenced, and take protective measures towards bone metabolism, in order to reduce the occurrence of serious low-traumatic fractures.

Objective: The objective of this thesis is to evaluate the diet with regard to risk factors leading to osteoporosis and bone fractures in postmenopausal women with breast carcinoma without metastases, which are treated with AI. Another objective for this group of women is to evaluate the changes of bone mineral density (BMD) and certain parameters of body composition during long-term treatment of AI.

Methods: The present study is based on a questionnaire containing a table to quote a three day diet, which was subsequently analysed to identify the overall energetic income, the income of proteins, fat, carbohydrates, dietary fibre and calcium. The supply of vitamin D was deduced for the serum concentration of calcidiol. BMD and the parameters of body composition (fat and non-fat matter) were determined using double-energy X-ray absorption (DXA). The risk factors for bone fractures were evaluated using FRAX.

Results: It was found that women with breast carcinoma without metastases, treated with AI have lower income of calcium (70-78 % of the recommended daily dose) and up to 64 % of women have insufficient income of vitamin D (calcidiol < 75 nmol/l). Further, low income of dietary fibre income was identified (53-74 % of recommended income, remarkably lower in women with osteoporosis). From retrospective DXA measurement data, an increased loss of BMD in lumbar spine (about 2,5 %) already after one year of treatment with AI, and after two year treatment in the area of the whole proximal femur and femoral neck (about 2,3-2,6 %, p<0,05). Further, a significant increase of BMI (body mass index) and FMI (fat mass index) in women with basal BMI < 25 after the second year of treatment with AI (p<0,05). The fat distribution analysis has shown an increased fat accumulation in the area of belly.

Conclusion: Low calcium income and low supply of vitamin D can lead to deterioration of the bone material. After two year treatment with AI, a decrease of BMD in all measured areas and undesired increase of BMI and FMI was identified in our group. Therefore, for these women, it is important to stress the importance of sufficient income of calcium, supply of vitamin D and appropriate physical exercise – i.e. to decrease the risk of developing osteoporosis by controlling the controllable risk factors. Appropriate diet and physical exercise are controllable factors, which have protective effect against the increase of FMI, and lead to decrease of risk of developing civilization diseases.

Keywords: osteoporosis, aromatase inhibitors, risk factors, diet