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FEATURES OF THE DEVELOPMENT OF OSTEOPOROSIS IN PATIENTS WITH RHEUMATOID ARTHRITIS

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Abstract

Osteoporosis (OP) in rheumatoid arthritis (RA) is 2-3 times more common than in the general population, but data on risk factors for its development in this disease are contradictory. It should be emphasized that periarticular OP is a well–known early manifestation of RA. It develops before the formation of bone erosions and is one of the diagnostic signs of this disease. In addition to periarticular surgery, generalized bone loss occurs in the first years after the onset of RA.

Key words

Osteoporosis, rheumatoid arthritis, risk factors

Introduction

Rheumatoid arthritis (RA) is an autoimmune disease of unknown etiology characterized by chronic erosive arthritis and frequent damage to internal organs [1]. It is one of the most common inflammatory rheumatic diseases: the incidence of RA in the general population is 1%, and in people over 65 it reaches 3% [2]. Despite significant progress in the treatment of RA, the life expectancy of patients is significantly lower than in the general population. This is explained not only by the course of the disease itself, but also by its combination with cardiovascular pathology, the development of serious infections, amyloidosis and osteoporosis (OP).

In RA, an increase in the frequency of OP is observed in all age groups of patients. According to various studies, it varies from 4 to 56% [3, 4]. The discrepancy in the frequency of OP is partly explained by the different research methodology, the number of patients included in the study, the ethnicity of patients and the heterogeneity of RA.

A number of reasons for the increased risk of OP in RA are considered. These include chronic inflammation (leading to activation of cellular immunity and increased production of pro-inflammatory cytokines); decreased functional activity of patients; activity and duration of RA; negative effects on bone metabolism of a number of drugs, primarily glucocorticoids (GK); hormonal disorders.

The risk factors (FR) for the development of OP in RA have not been sufficiently studied. Conditionally, they can be divided into two large groups: independent of the underlying disease and related to it. The FR associated with RA include: chronic inflammation (leading to activation of cellular immunity and increased production of proinflammatory cytokines); decreased functional activity of patients; activity and duration of RA; destructive changes in

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joints; negative effects on bone metabolism of a number of drugs, primarily glucocorticoids (GK). FRS of OP development independent of RA include: female gender, age over 65 years, low BMD, body mass index (BMI) <20 kg/m2 and/or body weight <57 kg, previous fractures, tendency to falls, family history of OP, smoking, hypogonadism, alcohol abuse, insufficient intake of calcium from food, vitamin D deficiency, low level of physical activity. The absolute and relative contribution of each of these factors to the development of OP in RA has not been precisely established. It is assumed that the most important of them are [5] severe RA, HA therapy, immobilization, old age, low body weight or low BMI. The combination of several phases of OP development in one patient has a cumulative effect; with an increase in their number, the risk of OP development increases.

Most authors identify functional insufficiency (FN), assessed by HAQ, as a significant predictor of the development of OP or a decrease in BMD in RA patients [6, 7, 8]. Thus, in the large-scale CORRONA study [9], which included 8,419 women with RA, a significant inverse relationship was revealed between the values of the modified HAQ [10] and the T-criterion in the lumbar spine and hip as a whole. The authors concluded that a decrease in BMD in women with RA is most influenced by high MNAQ values and menopausal status. L. Sinigaglia et al. [7], who observed 925 RA patients, were more likely to detect OP in patients with more pronounced FN according to HAQ. Logistic analysis confirmed that HAQ is an independent predictor of OP development. T.K. Kvein et al. [6] also noted that high MNAQ values (≥1.5) are independently associated with low BMD values (T-test less than -1) in the femoral neck and femur as a whole. G. Haugeberg et al. [3] report that high MHAQ is a predictor of decreased BMD in the proximal femur (p=0.002) and femoral neck (p=0.008), but not in the spine (p=0.24). Similar results were obtained in a later work by S. Sugiguchi et al. [11], who observed 105 women with low RA activity.

However, there is also the opposite data. Thus, in a two-year prospective follow-up of 366 patients with an average RA duration of 9.6 years, the Norwegian authors [5] found no association between MHAQ and a decrease in BMD in the spine, hip as a whole, and femoral neck. An important factor associated with a decrease in BMD is destructive changes in the hands and feet. It is known that after 3-5 years from the onset of RA, erosions are detected in 30-50% of patients [12]. It is assumed that the development of erosions and OP in RA are manifestations of a single pathogenetic mechanism [13], where an imbalance between the processes of bone resorption and bone formation plays a key role. This is confirmed by studies that reveal a link between X-ray changes (including Larsen index) in the hands, distal parts of the feet and a decrease in BMD/the development of OP [14,15]. Only a few studies [16] have not proven an association between Larsen's score and BMD. The role of GC in the development of OP has been confirmed in most major studies [5, 4,7]. The work of T.K. Kvein et al. [6] showed that the risk of OP in RA increases in patients taking HC by 2.91 times for the spine, 2.71 times for the proximal femur, and 3.05 times for the femoral neck. 394 women participated in this study, with an average age of 54.8-11.6 years. G. Haugeberg et al. [17] reported that current HA intake increases the risk of OP in the spine and hip as a whole, but not in the femoral neck. P. Oelzner et al. [18] found that the total dose of HA is an independent risk factor for the development of OP in men and women of postmenopausal age, but not in women with preserved menstrual cycle. However, a number of studies have not found the effect of HA on BMD [19,20], including in patients with early RA [21]. Thus, among the factors influencing the occurrence of OP in RA, it should be noted: pronounced functional disorders (high HAQ values), duration and severity of RA (high activity and pronounced radiological changes in the

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joints of the hands and feet), positivity in RF, long-term use of HA in large doses. However, it has not yet been established which of these factors are the most significant in the development of OP.

Age is one of the main predictors of OP development. With age, especially after 65 years, BMD gradually decreases and the risk of developing OP increases. It has been shown that the decrease in trabecular bone mass begins as early as 20 years, and the decrease in cortical bone mass begins after 30 years. After menopause, bone resorption begins to increase, as a result of which spongy bones can lose more than 5% of their mass, and the entire bone mass can decrease by 1-1.5% annually, and this process can last up to 15-20 years after menopause [5]. Ambiguous data have been obtained on the effect of gender on BMD in RA. Given that the development of primary OP in men occurs much less frequently than in women, a similar pattern should be expected in patients with RA. However, a number of studies have shown that the female sex is not a factor in the development of OP in RA and the frequency of OP is equally high in men and women [22,23].

Conclusion

The analysis of literature data shows large fluctuations in the frequency of OP in RA. In addition, ambiguous data have been obtained regarding FR in RA, both traditional and related to the disease itself. It is still unknown exactly which of these factors are the main predictors of the development of OP in RA. A comprehensive assessment of all possible FRS has not been carried out in the presented works. This issue has not been sufficiently studied in the literature, which requires further research.

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