

CHANGES AND COMPARISON OF BONE METABOLISM, BONE MINERAL DENSITY, MRI IN EARLY RHEUMATOID ARTHRITIS (ERA)

PP 30

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Objectives

The problem of early diagnosis of rheumatoid arthritis remains an important area of research in rheumatology. Rheumatoid arthritis (RA) is a chronic systemic inflammatory disease characterized by prominent joint manifestations. Articular involvement of the hand and wrist has been considered a very frequent presenting finding [1]. The presence of marginal erosions, seen on conventional radiographs of the hand and wrist, has been viewed as a specific and relatively sensitive diagnostic finding [2]. Conventional radiographs cannot assess synovitis, bone edema, and early marginal erosions [3-5]. Bone edema, erosions, and synovitis have been detected by magnetic resonance imaging (MRI) in patients with disease duration of < 1 year [3,4,6,7]. Bone edema and erosions are considered red flags for progression of bone damage in the future, and thus, modern concepts in RA imply that treatment with conventional disease-modifying antirheumatic drugs (DMARDs) and particularly biologic DMARDs, should ideally be started before erosive disease is detected.

We investigated changes in bone metabolism, bone mineral density in early rheumatoid arthritis (ERA) (up to 12 months). Data were compared with changes in the MRI study of the dominant hand.

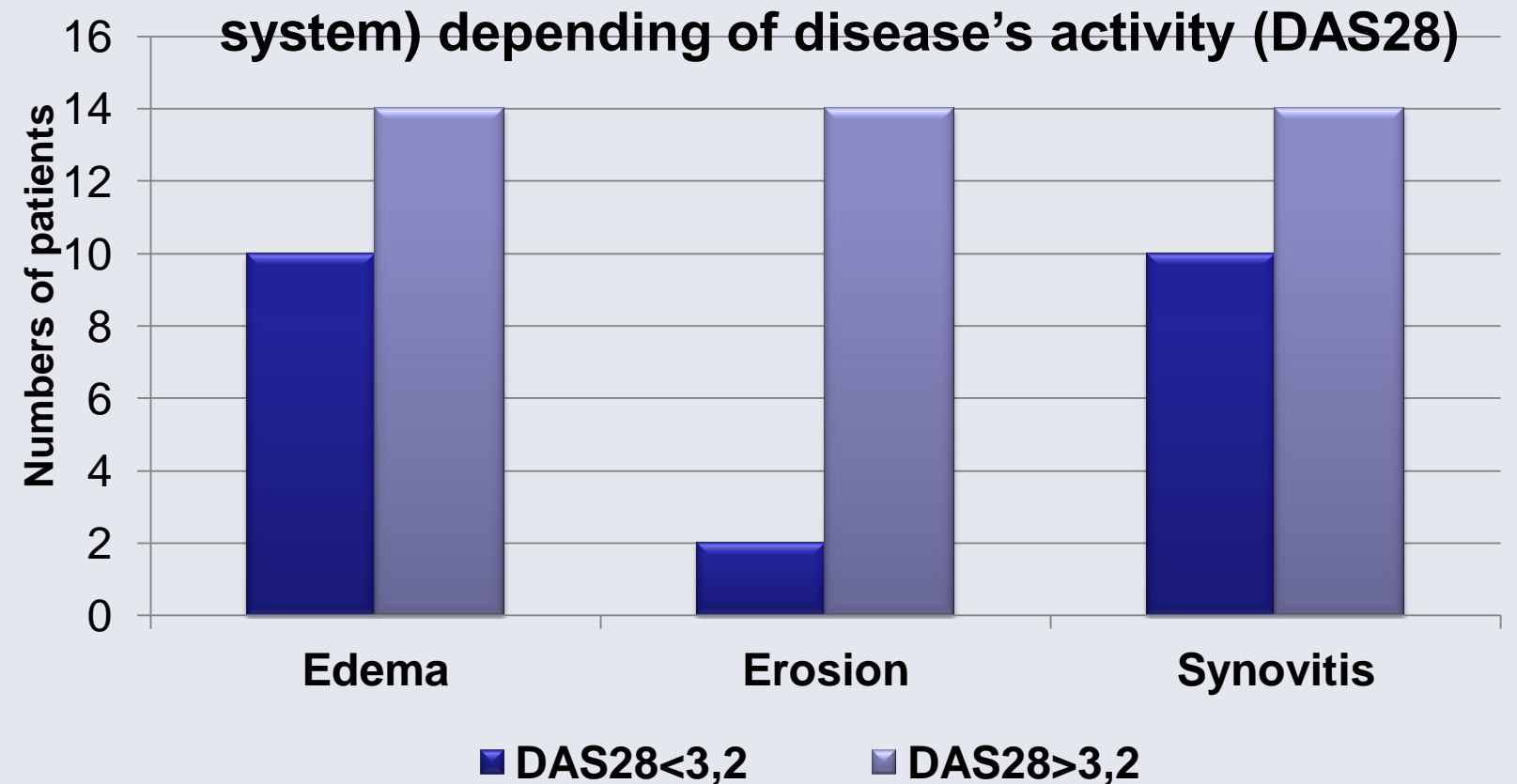
Methods

We observed 24 patients with ERA (with disease duration of <1 year), the average age - $33,6 \pm 5,7$ years. The men were 6 (25%), women - 18 (75%). Clinical assessment was evaluated using the disease activity score for 28 joint indices (DAS-28). Bone mineral density (BMD) was determined by DXA «Challenger» (DMS, France). Measurements of urinary pyridinoline (PYD) and deoxypyridinoline (DPD) and osteocalcin (OC) were performed. MRI of the dominant hand was performed in 24 patients, fulfilling the ACR'2010 criteria for RA. MRI of the dominant hand and wrist was performed in the same MRI unit (1.5T; Siemens MAGNETOM Espree). The imaging protocol consisted of axial and coronal STIR images with 2,500, 60, 160 (repetition time, ms/echo time, ms/inversion time, ms) 3-mm slice thickness, 0.3-mm intersection gap, 256x256 imaging matrix, coronal spin-echo T1-weighted images with 500, 16 (repetition time, ms; echo time, ms) 3-mm slice thickness, 0.3-mm intersection gap, 256x256 imaging matrix; and coronal spin-echo fat-suppressed, T1-weighted images with 500, 16 (repetition time, ms/echo time, ms) 3-mm slice thickness, 0.3-mm intersection gap, 256x256 imaging matrix before and coronal and axial images immediately after intravenous administration of 0.1 mmol/kg Gd-DTPA. Assessment of bone marrow edema, synovitis and bone erosions was performed by the OMERACT RA MRI scoring system.

Results

We found a significant increase in PYD and DPD and no changes of the OC level in the ERA patient's. The severity of inflammation and the number of inflamed joints by DAS28 score was associated with increased excretion of PYD and DPD, but not to the level of OC. Decrease BMD in the wrist and radius was observed in all patients. BMD correlated with markers of formation and resorption, as well as high rates of disease activity on DAS28. MRI of the dominant hand in patients with ERA in scoring (quantitative) assessment identified by OMERACT synovitis (all patients), bone marrow edema (all patients) and erosions (16 patients - 66.7%). Identification of synovitis and erosions on MRI correlated with high disease activity, decreased BMD. The appearance of bone erosions was associated with a slight decrease in OC and increased excretion of PYD and DPD.

Prevalence of edema, erosion, synovitis (evaluated with the OMERACT RA MRI scoring system) depending of disease's activity (DAS28)



Conclusions

These data emphasize the early increase in the activity of bone resorption markers with the absence of reducing the activity of bone formation markers in early rheumatoid arthritis. Changes in bone metabolism with an increased resorption correlate with disease activity and detection of erosions on MRI.

References

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