research within the field in lay language the patients can experience self-empowerment and the need for patient education can be met.

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The cost-opportunity of screening: osteoporosis in the general population

OP0323

INCIDENCE OF CLINICAL FRAGILITY FRACTURES IN POSTMENOPAUSAL WOMEN WITH RHEUMATOID ARTHRITIS. A MULTICENTRIC CASE-CONTROL STUDY

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Background: Incidence of clinical fractures in rheumatoid arthritis (RA) is not as well-known as hip or vertebral fracture incidence.

Objectives: 1. To estimate the incidence of clinical fragility fractures in a population of postmenopausal women diagnosed with RA and compare it with that of the general population; 2. To analyze the risk factors for fracture.

Methods: 330 postmenopausal women with RA from 19 Spanish Rheumatology Departments, randomly selected from the registry of RA patients in each center. The control group consisted of 660 Spanish postmenopausal women from the Camargo Cohort. Clinical fractures during the previous 5 years were recorded. Assessed risk factors for fracture were: sociodemographic characteristics, BMD and variables related to RA.

Results: Median age of RA patients was 64 yrs. vs. 63 yrs. in controls (ns). Evolution of the disease was 8 yrs. 78% and 76% had RF and ACPA+, respectively. 69% of patients were in remission or low activity. 85% had received glucocorticoids and methotrexate and 40% at least one biological DMARD. We identified 105 fractures (87 fragility and 18 traumatic) in 75 patients. Fifty-four patients and 47 controls had at least one major fracture (MF) ($p < 0.001$). Incidence of MF was 3.55 per 100 patient-year in patients and 0.72 in controls. Risk factors for MF in RA patients were age, previous fracture, parental hip fracture, postmenopausal period, hip BMD and cumulative dose of glucocorticoids. In controls, risk factors were age, age at menopause and lumbar BMD.

Among RA-associated factors, MFs were associated with erosions, disease activity and disability. Previous fracture in RA patients was a strong risk for MF (HR: 10.37 [95% CI: 2.95-36.41]).

Conclusion: Between 3 and 4 of every 100 postmenopausal women with RA have a major fracture per year, four times more than the general population. Disease activity and disability associated with RA, the cumulative dose of glucocorticoids and mainly previous fracture are associated with the development of fragility fractures.

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OP0324

CLUSTERING OF FRAGILITY FRACTURES BY SITE IN PATIENTS REFERRED FOR BONE MINERAL DENSITY ESTIMATION: AN OBSERVATIONAL STUDY

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Background: Fragility fractures (FF) are those resulting from mechanical forces equivalent to a fall from standing height or less [1]. They most commonly occur in the spine (vertebrae), forearm, and femur, but also occur at other sites. Prevalence markedly increases with age, due to age-related and menopause-related bone loss. FF cause substantial pain and disability, and are associated with decreased life expectancy. While many studies have investigated risk factors associated with FF, there are few data on the association between FF sites in at-risk patients.

Objectives:

1. Establish the most common sites of FF in patients presenting for bone mineral density (BMD) estimation.
2. Identify patterns of co-existing FF in the above cohort by applying cluster analysis.

Methods: We retrospectively reviewed the clinical records of 28868 patients presenting for BMD estimation at a district general hospital in North West England, 2004-2016, identifying those who had sustained one or more FF. Site(s) of FF were recorded for each patient, categorised as: ankle, elbow, femur, forearm, humerus, pelvis, ribs, spine, tibia or fibula (recorded as "tibfib"). Cluster analysis was performed on fracture sites, using Jaccard similarity coefficient. Results were plotted on a dendrogram and divided into clusters, as per results derived from elbow and silhouette cluster methods.

Results: Out of 28868 patients presenting for BMD estimation, 11003 were identified as having sustained one or more FF. 84.6% patients were female, with overall mean age 67.5 years and median T-score -1.12 SD. The most common site of FF was the forearm (n=5045), most commonly co-existing with fractures of the tibia or fibula. Frequencies of the most common and co-existing FF sites are shown in Figure 1 (top). Cluster analysis identified 3 clusters: ankle and elbow; forearm, tibia/fibula, ribs, and spine; pelvis, femur, and humerus. The second half of Figure 1 displays the dendrogram of cluster analysis results, with Jaccard similarity measure.

Conclusion: We applied cluster analysis to a large cohort of patients presenting for BMD estimation. Our results are in keeping with previous studies demonstrating the FF to most commonly occur in the forearm, and in those with osteopenia (T-score $-2.5 < -1$ SD) [2]. To our knowledge, this is the first study to apply cluster analysis to sites of FF. Results may be due to differences in cortical and trabecular bone structure, and have potential to aid prevention, monitoring, and management in at-risk patients.

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