

Original article

Change In Bone Mineral Density In Post Menopausal Women With Rheumatoid Arthritis

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Abstract

Introduction: Low bone mass is a serious complication of post menopausal women with rheumatoid arthritis. We determined the Change in Bone Mineral Density in postmenopausal women with rheumatoid arthritis. **Methods:** This retrospective cohort study was carried out on consecutive postmenopausal women with rheumatoid arthritis who were referred to the Azar 5th teaching hospital affiliated to Golestan University of Medical Sciences, North of Iran in 2009. The required data were gathered from the patients' medical records. The data were analyzed using SPSS software and statistical tests. **Results:** We studied 98 postmenopausal women with rheumatoid arthritis. Mean number of years since menopause and mean duration of disease were 9.39 and 5.13 respectively. T Score mean in femoral neck and lumbar spines was -1.45 ± 1.26 and -2.45 ± 1.44 respectively. The overall prevalence of osteoporosis at both the lumbar spine and femoral neck was 13.3. We have found a significant correlation between age, duration of disease, duration of menopause and bone mineral density (P-Value < 0.01). **Conclusion:** Our results indicate a negative effect of age, number of years since menopause and duration of disease on bone mineral density. So, BMD should be measured in high risk women prior to the implementation of any treatment or prevention program.

Key Words: Bone mineral density, rheumatoid arthritis, osteoporosis, postmenopausal

Introduction Osteoporosis is an age-related disorder that is characterized by reduced bone mineral density (BMD) along with bone matrix and microarchitectural deterioration of bony tissue, with a consequent increase in bone fragility and susceptibility to fractures^{1,2}. Osteoporosis is a common disease among the elderly, particularly the post-menopausal women³⁻⁷. BMD values depend on several factors such as age, sex, age at menopause and certain underlying diseases including rheumatoid arthritis⁸⁻¹⁰. Rheumatoid arthritis (RA) is a chronic inflammatory disease characterized by symmetrical polyarthritis and local bone erosion¹¹⁻

¹⁵. Generalized bone loss has been commonly demonstrated in RA patients¹⁵. The age at onset of RA is usually 50-60 old year and two thirds of the patients are postmenopausal women¹⁶. It affects 0.5-1% of the world's population and considerably impairs the quality of life¹¹⁻¹³. Osteoporosis is two times more prevalent in patients with rheumatoid than in the general population and increase with age^{10-11,17-18}. The incidence of osteoporosis of the hip and spine is about 15-20% among patients with rheumatoid arthritis¹⁹. The prevalence of osteoporosis among Iranian women varies from 6 to

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43.03 percent²⁰⁻²³. A study in the south of Iran showed 19.6% of patients with rheumatoid arthritis had osteoporosis at both the lumbar spine and femoral neck²⁴.

In the present study, we have evaluated the change in bone mineral density in post menopausal women with rheumatoid arthritis.

MATERIAL & METHODS This retrospective cohort study was carried out on consecutive postmenopausal women with rheumatoid arthritis who were referred to the Azar 5th teaching hospital affiliated to Gorgan University of Medical Sciences, Gorgan, North of Iran in 2009. The required data, including age, age of menopause, years has passed since the last menses, and duration of the underlying disease, was gathered from the patients' medical records. The BMD assessment was performed both at lumbar spine (L1-L4) and femoral neck using DXA (Hologic, QDR 4500C). The individuals with underlying diseases that may positively or negatively affect bone mineral density values were excluded and bone mineral density was evaluated. Based on WHO classification, individuals with T-score > -1 are classified as normal, with $-1 > T\text{-score} > -2.5$ as osteopenic, and those with T-score < -2.5 as osteoporotic (25). The data were analyzed using SPSS software version 13.0. The descriptive data were presented as frequency, mean and SD, whereas regression, χ^2 , ANOVA and T-test were used for further analysis. P-values less than 0.05 were considered statistically significant. The protocol was approved by ethical committee of the institute.

RESULTS

Ninety-eight postmenopausal women suffering from rheumatoid arthritis, with a mean age of 57.88 ± 9.39 years (ranging from 44 to 98 years) were studied. 24 patients (24.5%) less than 50 years, 50 patients (51%) 50 to 65 years and 24 patients (24.5%) had more than 65 years old. Mean number of years since menopause was 9.39 ± 8.89 years, ranging from 1 to 48 years. Mean duration of disease was 5.53 ± 4.41 years, ranging from 1 to 20 years. T Score mean in femoral neck and lumbar spines was -1.45 ± 1.26 (-4.46 to 1.40) and -2.45 ± 1.44 (-5.53 to 0.40) respectively. According to the lumbar spine T Score, 46 patients (46.9%) had osteoporosis, 34 patients (34.7%) had osteopenia and 18 patients

(18.4%) had normal BMD. Furthermore, at the femoral neck region, 17 patients (17.3%) had osteoporosis, 46 patients (46.9%) had osteopenia and 35 patients (35.7%) had normal BMD. The overall prevalence of osteoporosis and osteopenia at both the lumbar spine and femoral neck was 13.3 and 15.3 percent respectively. Only 11.2 % of patients had normal bone mineral density at both the lumbar spine and femoral neck. The more years have passed since menopause the higher would be bone loss at lumbar spine ($r=0.43$, P-Value= 0.0001) and femoral neck ($r= 0.26$, P-Value= 0.01) [Fig: I, II]. There was a significant correlation between the duration of the disease and bone loss at lumbar spine ($r=0. 22$, P-Value=0. 03); such a significant correlation, however, was not reported in the femoral neck region ($r=0. 15$, P-Value= 0.12) [Fig III, IV]. There was a positive and significant correlation between age and BMD values at both lumbar spine ($r= 0.51$, P-Value ? 0.0001) and femoral neck ($r= 0.39$, P-Value? 0.0001) [Fig V, VI].

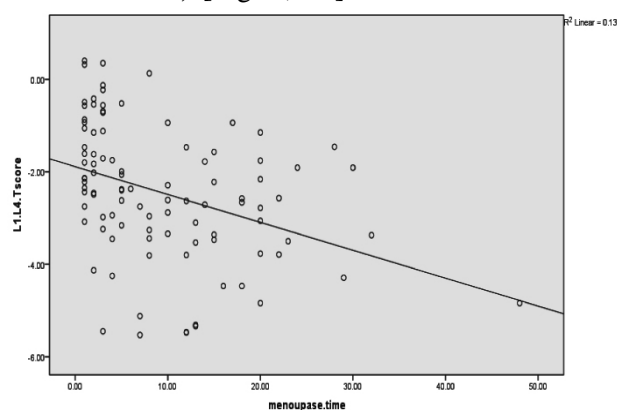


Fig 1. Correlation between menopause duration and BMD at the lumbar spine

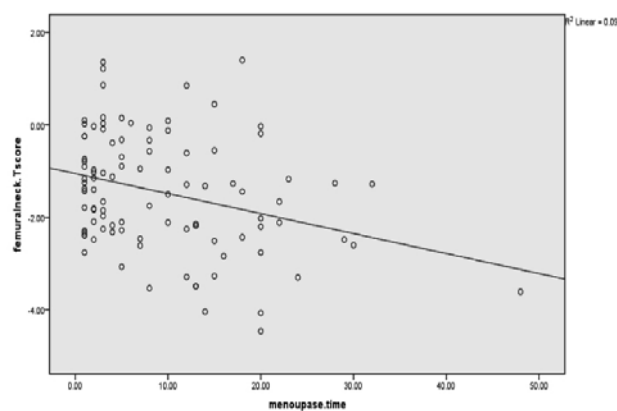


Fig II. Correlation between menopause duration and BMD at the femoral neck

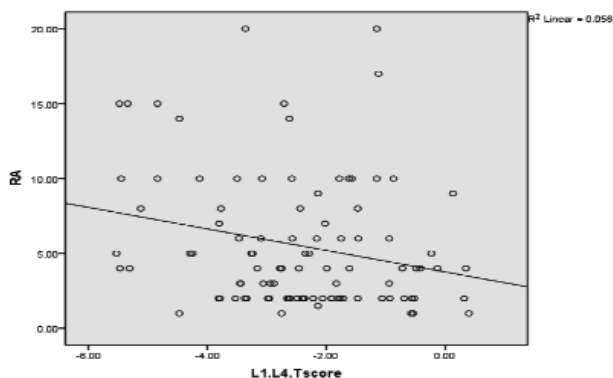


Fig III: Correlation between duration of disease and BMD at the lumbar spine

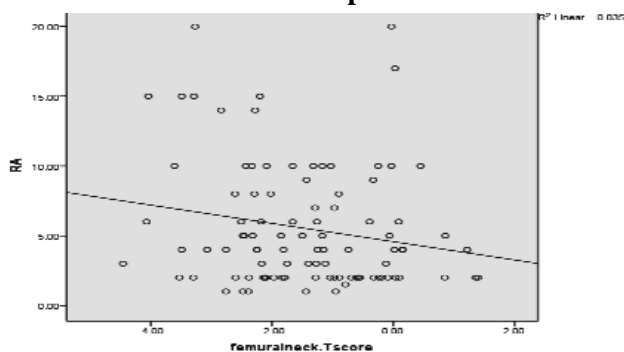


Fig IV: Correlation between duration of disease and BMD at the femoral neck

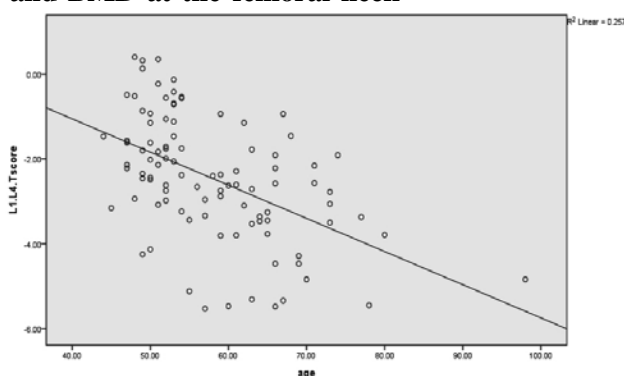


Fig V: Correlation between age and BMD at the lumbar spine

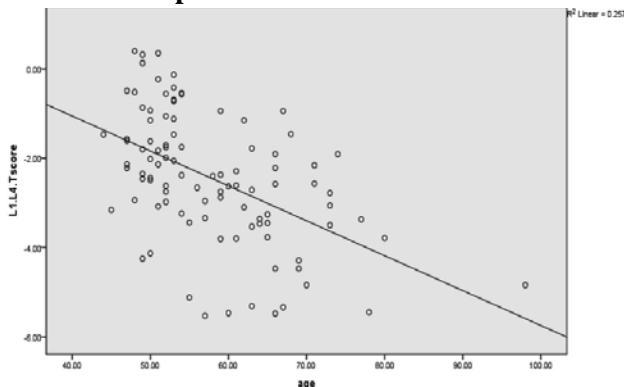


Fig VI: Correlation between age and BMD at the femoral neck

TableI: Prevalence of osteoporosis in different places of Iran

Place	Prevalence of osteoporosis	
	lumbar spine	femoral neck
Booshehr	32	29.6
Khuzestan	5.4	15.3
Kordestan	17	30.8
Yazd	20.5	43
Iran(review)	18.9	18.9

TableII: Prevalence of osteoporosis in different places of the world

place	Prevalence of osteoporosis	
	femoral neck	lumbar spine
Japan	11.6	38
Saudi Arabia	6.3	38.3
Canada	7.9	12.1
Japan	27	----

Discussion

Our results indicate that 11.2 percent of post-menopausal women with rheumatoid arthritis had normal BMD at the both lumbar spine and femoral neck. This is much lower than that reported in both previous Iranian and international studies^{6, 8, 22, 26-31}. “Tables 1, 2” show prevalence of osteoporosis at the lumbar spine and femoral neck in the different places in Iran and world. These discrepancies can be explained based on differences in race, lifestyle and dietary habits of the people of these countries. Several studies in Japan, Brazil³², Sweden³³ and Italy³⁴ have considered the duration of disease as a risk factor for low bone mineral density. Corroborating with our results, some studies have pointed out a significant relation between longer time since menopause and Considering the nature of rheumatoid arthritis, the duration of the disease seems to aggravate the bone loss trend. The present study, however, showed this relation only for the spine, indicating that the duration of disease does not significantly affect bone mineral density values at the FN. Haugeberg et al, on the contrary to our findings, revealed a significant relation between the duration of disease and reduced bone mineral density values at the femoral neck rather than lumbar spine¹⁰. In line with our study, many

studies have introduced age as an important factor for bone loss^{22-23, 35-36, 38, 40-42}. Jang et al showed that the prevalence of osteoporosis in postmenopausal women increases with age from 30.6% in those aged between 45 and 64 to 68.7 percent in those aged 75 and over⁴³⁻⁴⁴.

Conclusion

The present research indicated the negative effect of age, number of years since menopause and the duration of rheumatoid arthritis on bone mineral density. So, it is recommended to measure BMD values and implement prevention programs for

high-risk women. In our study, there was no control group and thus we were unable to compare our results between the affected individuals and the general population. Future prospective studies are therefore necessary to gather more accurate information in this regard.

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