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Original article

Effect of multiparity on bone mineral density,
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ABSTRACT

Objective: Our aim was to investigate the effect of parity on osteoporosis by evaluating bone mineral density, markers of bone turn-over and other factors that are effective in osteoporosis in multiparous (five deliveries or more) and nulliparous women in the post-menopausal period.

Methods: A total of 91 multiparous (five deliveries or more) and 31 nulliparous post-menopausal women were included in this study. All patients were interviewed on sociodemographic characteristics, gynecologic history, personal habits, levels of physical activity, and life-long intake of calcium. Bone mineral density was measured at lumbar (L1–4) and femoral neck regions with DEXA.

Results: The mean age of multiparous women was 58.79 ± 7.85 years, and the mean age of nulliparous women was 55.84 ± 7.51 . The femoral BMD was 0.94 ± 0.16 and lumbar BMD 1.01 ± 0.16 in multiparous women, femoral BMD was 0.99 ± 0.16 and lumbar BMD 1.07 ± 0.14 in nulliparous women. There were no statistical differences between the femoral and lumbar T scores and BMD values of the two groups. Lumbar T scores and lumbar BMD showed a decrease with increasing total duration of breast-feeding in multiparous women. The independent risk factors for osteoporosis in the regression analysis of multiparous women were found to be the duration of menopause and body weight of 65 kg and less.

Conclusion: There is no difference between the bone mineral densities of multiparous and nulliparous women. Females with lower body-weight and longer duration of menopause should be followed-up more carefully for development of osteoporosis.

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Efeito da multiparidade sobre a densidade mineral óssea, avaliada por marcadores de remodelação óssea

R E S U M O

Palavras-chave:

Marcadores de remodelação óssea
Multiparidade
Osteoporose

Objetivo: Investigar o efeito da paridade sobre a osteoporose por meio da avaliação da densidade mineral óssea, marcadores de remodelação óssea e outros fatores eficazes na avaliação da osteoporose em múltiparas (cinco partos ou mais) e nulíparas no período pós-menopausa.

Métodos: Foram incluídas neste estudo 91 múltiparas (cinco partos ou mais) e 31 nulíparas, todas na pós-menopausa. As pacientes foram entrevistadas para a determinação das características sociodemográficas, história ginecológica, hábitos pessoais, níveis de atividade física e ingestão de cálcio ao longo da vida. A densidade mineral óssea foi medida na região lombar (L1-4) e do colo femoral com a Dexa.

Resultados: A média de idade das múltiparas e nulíparas foi de $58,79 \pm 7,85$ anos e $55,84 \pm 7,51$, respectivamente. Nas múltiparas, a DMO femoral e lombar foi de $0,94 \pm 0,16$ e $1,01 \pm 0,16$, respectivamente; nas nulíparas, a DMO femoral e lombar foi de $0,99 \pm 0,16$ e $1,07 \pm 0,14$, respectivamente. Não houve diferença estatisticamente significativa entre os T-escores femoral e lombar e os valores de DMO dos dois grupos. O T-escore e a DMO lombar mostraram uma diminuição em caso de aumento na duração total da lactação materna em múltiparas. Encontrou-se que os fatores de risco independentes para a osteoporose na análise de regressão das múltiparas são a duração da menopausa e o peso corporal menor ou igual a 65 kg.

Conclusão: Não há diferença entre a densidade mineral óssea de múltiparas e nulíparas. As mulheres com menor peso corporal e maior duração da menopausa devem ser acompanhadas com mais atenção para determinar se há desenvolvimento de osteoporose.

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Introduction

Osteoporosis is a metabolic bone disorder characterized by a decrease in bone strength and an increase in bone fragility.¹ Genetic, hormonal and environmental factors contribute to osteoporosis development.²⁻⁴ Pregnancy and lactation periods are processes which have an effect on the calcium and bone metabolism of the mother. A BMD loss of 2–9% was reported in the postpartum period.⁵ Longitudinal studies have shown that these losses are reversible in especially the women from developed countries.⁶ On the other hand, clinical entities such as pregnancy- and lactation-associated osteoporosis,⁷ osteoporosis of the hip may develop in the post-partum period in some patients, which may be a cause of serious morbidity.⁸ The effects of multiparity on the bone mineral density in the post-menopausal period are still controversial.

While some researchers report an absence of a positive or negative effect of parity on bone mineral density,^{9,10} there are others who have reported a positive effect¹¹ or a negative effect on bone mineral density.^{12,13} Increase in body weight during pregnancy, increasing estrogen hormone and multi-vitamin supplement taken during pregnancy are thought to have positive effects on BMD.¹⁴ On the other hand, inability to compensate the calcium transfer from the mother to the baby during pregnancy and lactation with diet in especially populations with lower socioeconomic status is thought to exert a negative effect on BMD.¹⁵ Turkey is a developing country, where multiparity is quite prevalent. Our aim was to investigate the effects of parity on osteoporosis, by evaluating

bone mineral density, markers of bone turnover, age at first pregnancy, duration of lactation and other factors associated with osteoporosis in multiparous (five or more deliveries) and nulliparous women in the postmenopausal period.

Materials and methods

This prospective study was conducted in the Department of Obstetrics and Gynecology, and Department of Physical Medicine and Rehabilitation at Kocaeli Derince Education and Research Hospital. A total of 327 postmenopausal women with five or more deliveries or who had never given birth were offered participation in this study among female patients who were admitted at our institution. Of those, 124 postmenopausal patients refused to participate in the study, and 81 postmenopausal women were excluded due to exclusion criteria. A total of 91 postmenopausal women with ≥ 5 deliveries and 31 women who had never given birth were included. Data were gathered by personal interviews after the patients were informed about the study and their consents were obtained. The study protocol was performed according to the Helsinki Committee requirements and was approved by the institutional review board of Kocaeli University (KOU KAEK 2012/44).

Postmenopausal women aged between 45 and 75 years were included in this study. Persons with diabetes, chronic renal or pulmonary disease, collagen and rheumatic disease, hypogonadism, serious cardiac disease, thyroid dysfunction, malabsorption syndrome, history of drug use that may cause

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