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Original Article

Effect of diet and lifestyle habits on bone density in postmenopausal women

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ABSTRACT

Aim: The present study aimed to assess the effect of diet and lifestyle habits on bone density in postmenopausal women.

Materials and methods: A total of 200 women between 45 to 65 years old suspected to osteoporosis were recruited for this study. A cross-sectional hospital-based study has been performed to investigate 200 osteoporosis suspected women. Data collected for this study included filling questionnaires through personal interviews, use of case records, files and documents. Multiple logistic regression was used to estimate the association between osteoporosis and its risk factors and obtaining the odds- ratio of each of the risk factors. All statistical analyses were performed using statistical software SPSS version 13.0 (SPSS Inc, Chicago).

Results: The study showed that out of total 200 women who underwent the BMD (bone mineral density) assessment, 14.5% had osteoporosis and 37% had osteopenia. The bone mineral density decreased with advancing age and duration of menopause and 48.5% had normal BMD. Seventy-five percent of the women had two or more risk factors. Risk factors were Postmenopausal (AOR = 2.55), hysterectomy (AOR = 2.18), low calcium intake (AOR = 1.95), cigarette smoking (AOR = 1.29) and family history of osteoporosis (AOR = 1.48). By logistic regression, antiresorptive therapy found to be a positives predictor and negative predictors were exercise (AOR = 0.38), calcium supplemental (AOR = 0.61) and hormone replacement therapy (AOR = 0.47).

Conclusion: Findings showed a high prevalence of osteoporosis and osteopenia among women with advancing age, during menopause and post menopause indicating an increased risk of fractures in older women.

1. Introduction

Menopause is the stage of a woman's life, typically between the ages of 45 and 55, when she stops having menstrual periods. The transition from a reproductive stage to menopause occurs naturally over a period of years, but it can also be brought on suddenly by any medical procedure that damages or removes the ovaries.[1] Menopause is also called as change of

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life and is the opposite of the menarche. Some women experience common symptoms of menopause, such as hot flashes and mood swings, while other women experience few or no symptoms at all. Postmenopausal is defined formally as the time after which a woman has experienced twelve consecutive months of amenorrhea (lack of menstruation) without a period. The average length of the postmenopausal has been increasing. With greater longevity, a woman will soon be postmenopausal on the average a third of her life.[2] Osteoporosis is a multi factorial and silent epidemic disease which is the first fourth major threat to health in twenty first century. Osteoporosis has even more mortality than most cancers.[3,4] There is no other pernicious disease in whole medical history which has not been paid enough attention to 50% of women aged >45 and 90% of women aged >75 in U.S have osteoporosis respectively and anticipated to have more than 4.5 million hip fractures until 2050.[5,6] The major risk factors for osteoporosis are well documented. They include female sex, white or Asian ethnicity, positive family history, postmenopausal status, null parity, short stature and small bones, leanness, sedentary lifestyle, low calcium intake, smoking, alcohol abuse, and high caffeine, protein, or phosphate intake. Endocrine disorders, gastrointestinal disorders and certain medications can also increase risk.[7,8]

Hence an X-ray cannot reliably measure bone density but is useful to identify spinal fractures. In the early stages of bone loss, usually have no pain or other symptoms. One of the best and most common ways to monitor bone health is by having a bone mineral density (BMD) test. If don't already have osteoporosis but could be at risk, a BMD can help doctor to predict likelihood of having a fracture. Repeated BMD tests allow the doctor to compare the results and see if patients are losing bone or maintaining it. A BMD is also used to confirm an osteoporosis diagnosis; in fact, it's the only test than can diagnose osteoporosis. Dual energy X-ray absorptiometry (DXA, formerly DEXA) is considered the gold standard for the diagnosis of osteoporosis.[9–11] Bone densitometry is a safe, fast, and exact test. By the way DXA is an expensive detection tool and could not be use as a screening method to all population thus our study aim to identify the high risk group and their associated osteoporosis risk factors which is notable when will be apply in future public health policy and programs.[12]

Osteoporosis is a substantial cause of morbidity and mortality and affects 25 million Americans, predominantly postmenopausal women.[13] The National Osteoporosis Foundation estimates direct and indirect costs associated with this disorder to be $18 billion, with $7 billion related to hip fractures alone.[10,14] White women aged 50 years have a 40% chance of sustaining an osteoporosis-related fracture during the remainder of their lifetimes.[15,16] Hip fracture is of particular concern because of the 20% chance of excess mortality within 1 year of the event.[7] Osteoporosis is an extremely important problem in primary care where most postmenopausal women are seen for physician visits. Among the 20 million women nationally with osteoporosis, only 4 million have been diagnosed with this disorder. About 1.3 million osteoporotic fractures occur each year in the United States.[14] The present study has been taken up to assess the effect of these risk factors and lifestyle on BMD of the study group and consequent awareness plane for the target population to prevent osteoporosis.

2. Subjects and methods

2.1. Study design

A cross-sectional hospital-based study has been performed to investigate 200 osteoporosis suspected women aged 45–65 referring to Atieh Hospital in Tehran, Iran. It is a questionnaire based study which involves data on dietary habit, medication, physical activity, and lifestyle (such as smoking, alcohol, tea, coffee, and soda consumption).

2.2. Data collection

Data collected for this study included filling questionnaires through personal interviews, use of case records, files and documents. The questionnaire covered the following factors and information: demographic characteristics (including age, marital status), menstrual and obstetrical history (menarche age, age of menopause, parity and abortion) and medical condition and medication. Medical condition included (history of endocrine disorders like diabetes and thyroid, heart disease, kidney, asthma, and other related medical problem). Moreover, any disorders and discomfort related to bone and joint that needs treatment or rest were also included in the present study. Medication included most common related drugs and supplements like: calcium supplementation, hormone replacement therapy (HRT) and steroids with at least lowest available therapeutic and/or preventive dose that were used continuously 6 months or more for calcium and HRT and one month or more for steroids. Nutrition questionnaire: life time food frequency questionnaire and food habits. Physical activity, exercises, self-imagination, reporting physical activity and standing on feet (exercises at about 20–30 min daily which was repeated 3 times a week). Habits: alcohol consumption, smoking and tobacco use.

Anthropometric characters: height, weight, BMI (weight and height were used to be measured and recorded in all BMD centers before measurement of bone density). Weight less than 60 kg and BMI less than 26 have been shown as risk factors of osteoporosis. Height less than 155 cm has been shown as a risk factor of osteoporosis in subjects. Early menopause (before 45 years old), late menarche (after 14 years) and postmenopausal duration more than 5 years were shown as significant risk factors.

2.3. Study subject and size

Study subject has enrolled women between 45 and 65 old suspected to osteoporosis. Thus we expect number of 200 participants according to previous record.

2.4. Statistical analysis

We have initially described characteristics of our study population which involves: demographic (age, gender, marital status, resident place, ethnic/race…else), socioeconomic (family size, household income …else), information on osteoporosis risk factor, subsequently the cross tabling of each explanatory variable by outcome variable (BDML), using