

# Abstract

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**TITLE OF THE ABSTRACT :**

**“Bone mineral density and Bone turnover markers in healthy pre and postmenopausal women and the influence of multiple factors on them”**

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**KEY WORDS:**

Bone mineral density, Bone turnover markers, C-Terminal Telopeptides TypeI Collagen(CTX), Procollagen typeI N-terminal propeptide(P1NP), Osteocalcin(OC), Deoxy Pyridinoline(DPD).

**AIM / OBJECTIVES:**

To study Bone Mineral Density(BMD) and Bone Turnover Markers(BTMs) and factors influencing them in postmenopausal-women and their premenopausal-daughters and to study reference ranges of BTMs and their correlations with BMD.

**MATERIAL AND METHODS:**

This cross sectional study was conducted at an urban area in Vellore district. One hundred fifty two subjects which included 76 postmenopausal women and their daughters (n=76) who met the inclusion criteria were recruited from the community after obtaining a written informed consent. Details with regards to age, parity, dietary calcium intake, sunlight exposure and socioeconomic status, physical activity using “International Physical Activity Questionnaire”(IPAQ) and BMI were collected. Fasting blood and second void morning urine samples were obtained for measurement of BTMs (sCTX, sPTNP1, sOC and urine DPD respectively) and bone mineral parameters. BMD was measured by DXA.

**RESULTS:**

Osteoporosis was seen in 50% of the postmenopausal women and low bone mass was seen in 9% of daughters at spine. Ethnicity based reference range of BTMs were derived. Significant inverse correlation was found between BTMs and the BMD with good analytical performance (AUC>0.70, P <0.001) in the diagnosis of osteoporosis. Daughters born to mothers with osteoporosis at spine had lower BMD compared to daughters whose mothers did not have osteoporosis (P=0.047). Low socio-economic status (SES) was found to have a detrimental effect on BMD at spine (Odds 3.2,P=0.03).

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**CONCLUSIONS:**

Osteoporosis was seen in half of the postmenopausal women and low bone mass seen in one tenth of the premenopausal women. The reference range for various BTMs was studied in a well-defined cohort of premenopausal women and their mothers. Lower SES was a significant risk factor for osteoporosis which highlights the importance of simple interventions to improve the peak bone mass and reduce the bone loss by optimising calcium and vitamin D intake, encouraging physical activity, awareness and allocation of resources for screening and treatment of osteoporosis in the community. In view of good analytical performance of BTMs in the diagnosis of osteoporosis and the cost effectiveness and ease of estimation of their assays, in future, it may be possible to use BTMs as a screening tool in osteoporosis. However, it needs further validation in larger studies.

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