# A study to assess the role of Common Biochemical Markers in bone mass loss in postmenopausal women at selected Hospitals in Indore

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Menopause is derived from two Greek words,'meno' (month) and 'paus' (age) (to stop). Menopause is defined clinically as the cessation of menstruation for a period of twelve months. Menopause is defined physiologically as the permanent cessation of menstruation caused by decreased ovarian hormone secretion, which can occur naturally or be induced by surgery, chemotherapy, or radiation. In women, the postmenopausal stage is essentially an oestrogen-deficient state. Menopause and ageing are both associated with an increase in bone mass loss. Menopause occurs when the balance between bone formation and resorption is disrupted, resulting in a negative remodelling balance. Osteoporosis is a major public health concern among middle-aged and older women.

Osteoporosis is more common in postmenopausal women and not only causes morbidity but also significantly reduces quality of life in this population. In developing countries, there is a scarcity of information about the risk factors for osteoporosis. The most used biomarker of bone formation is serum alkaline phosphatase (ALP). ALP is a common enzyme that aids in the formation of osteoid and bone mineralization. The serum ALP pool is made up of several dimeric isoforms derived from various tissues including the liver, bone, intestine, spleen, kidney, and placenta. Thus, the current study aims to assess the risk of accelerated bone mass loss in postmenopausal women by measuring bone markers such as alkaline phosphatase (ALP) and serum calcium.

**Methods and Materials**

In this small cross-sectional study, 200 women were divided into two groups: 100 post-menopausal women and 100 pre-menopausal women. Calcium supplementation was an exclusion criterion for post-menopausal subjects, while pregnancy and the use of oral contraceptives were exclusions for pre-menopausal subjects. In continuous measurements, the mean (SD) is used to represent the average results (min-max). The significance level of the findings was set at P 0.05. The Student's t test (two tailed, independent) was used to compare the significance of study parameters on a continuous scale between two groups. The Pearson correlation coefficient was calculated for the experimental group.. Statistical analysis software (SPSS) 21 was used to examine the data.

**Results**

The result revealed that  the post-menopausal group's serum calcium levels were 7.44 (SD 0.71) while the pre-menopausal group's were 9.88 (SD 0.92) (P = 0.000). Serum ALP levels were higher in the post-menopausal group (P = 0.043) than in the pre-menopausal group (72.41). An SD of (SD 79.60). ALP results were also in line with expectations. Post-menopausal women had higher ALP levels and lower calcium levels in their blood. The post-menopausal group had significantly higher levels of alkaline phosphatase (ALP) than the pre-menopausal group (110.88 (SD 71.4), P = 0.044). Osteoblasts, monocytes, and T cells produce cytokines when oestrogen deficiency occurs during menopause, which in turn increases osteoclastic activity, resulting in bone resorption. As a result of this action, calcium concentrations rise because it alters the rate of calcium reabsorption, absorption, and excretion. Consequently, in postmenopausal women, serum calcium and ALP levels have a negative correlation. For many years after menopause (YSM) studies, there was no correlation between ALP and serum calcium levels (12–17). Early postmenopausal women, on the other hand, have higher levels of calcium and ALP than women who are past menopause.

**Conclusion**

An increase in bone turnover accelerates bone mass loss in postmenopausal women in the normal range. Post-menopausal women have significantly lower serum calcium levels than pre-menopausal women, but significantly higher serum ALP levels, according to the results of this study. Serum calcium and ALP levels were also found to have a significant negative correlation in the experimental group

**Reference**

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