

## Study of calcium levels in pre- and post-menopausal women

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### ABSTRACT

**Introduction:** Millions of people are affected around the world by osteoporosis. This is mainly due to deterioration of bone tissue. Recent times, mortality rate and morbidity have increased to a greater extent in association with osteoporosis which is a significant health problem. Appropriate calcium and Vitamin-D intake is now widely accepted by people as one of the important clinical strategies in addition with all other medications simultaneously. The current study aimed to determine the calcium level in pre- and post-menopause women. **Materials and Methods:** Patients were selected from those attending the Outpatient Department of Saveetha Dental College and Hospitals and divided into two groups. Group I consists of normal healthy menstruating women and Group II consists of postmenopausal women. **Results:** All the data were analyzed using the SPSS package. Paired sample *t*-test analysis was done to find out significant differences between the two groups. All the tests were considered statistically significant at  $P < 0.05$  level. The mean calcium level of premenopause women is  $9.87 \pm 0.60$  and postmenopause was  $7 \pm 0.78$ . They showed a significant decrease level in postmenopause women. **Conclusion:** The overall effect of calcium level is more in premenopause women than postmenopause women. Dietary supplementation may be helpful for the postmenopausal women to avoid the risk of osteoporosis.

**KEY WORDS:** Bone, Calcium, Mineral density, Postmenopause, Premenopause

### INTRODUCTION

Millions of people are affected around the world by osteoporosis. This is mainly due to deterioration of bone tissue. Recent times, mortality rate and morbidity have increased to a greater extent in association with osteoporosis which is a significant health problem. Appropriate calcium and Vitamin-D intake is now widely accepted by people as one of the important clinical strategies in addition with all other medications simultaneously.<sup>[1]</sup> Females mainly after their ovarian function diminish, serum levels decline as well as their estrogen production declines they are likely to be affected by osteoporosis. Estrogen reduction alone not only reason behind osteoporosis, it also depend on environmental factors that include our entire dietary intake too. Due to increase calcium intake, loss of bone in weight stable was observed both in pre- and post-menopausal women. A comparative

study between woman who took calcium to greater than normal (800 mg/day) for the past 1–2 years showed a 0.5–1% decrease in bone when compared with those women who consume <800 mg/day. There was a rapid bone loss in women who had later set of menarche.<sup>[2]</sup> Osteoporosis, in general, is characterized by low bone mass and deterioration of bone tissue that leads to bone fragility and increases the risk of bone fractures. Osteoporosis simply defined as a metabolic bone disease. Among minerals, calcium is one most abundant mineral present in our body around 99% is in our bone and teeth.<sup>[3]</sup> Osteoporosis is increased with postmenopausal women due to the decrease in the ovarian estrogen associated with bone loss and increased bone remodeling.<sup>[4]</sup> Fractures have an increase in women not only due to the rate of bone loss but also due to loss that occurs after menopause.<sup>[5]</sup> A study proved that only 20% of women suffer from osteoporotic fractures by the age of 65 and 30% of women affected by the age of 90.<sup>[6]</sup> As any other minerals, calcium is also concerned for development, growth and provides a structure and strength. Calcium levels play an important role in mediating vascular

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contraction and vasodilation, nerve transmission, and glandular secretion. Calcium in our body has its highest proportion in bones which is the reservoir of calcium.<sup>[7]</sup> Minimum amount of calcium intake minimizes bone loss during weight loss in obese postmenopausal women.<sup>[8]</sup> Osteoporosis is one of the major health problems in many developing countries and developed nation.<sup>[9]</sup> Calcium supplements should be taken as to decrease bone mass in postmenopausal women.<sup>[10]</sup> Today's, health issue of women after menopause is a major key issue in their lifestyle as osteoporosis is gradually increasing metabolic bone disease which is prevalence wider in postmenopausal women, especially India. Postmenopausal women have rapid bone loss when compared due to hormonal factors which are involved in bone fractures.<sup>[11]</sup> Many recent evidences have suggested innumerable that any disturbances in the body's calcium levels will underline many pathophysiological conditions in postmenopausal women and as an effective treatment calcium supplements can be taken. In women especially during their postmenopausal period is the critical time where they start losing their bone mass from the body and become very weak when compared to premenopausal women.<sup>[12]</sup> Each and every individual varies in their dietary supplements and the ability of ingesting the amount of calcium levels.

Several studies stated that higher intake of calcium in food or supplements reduce the risk rate of colon cancer.<sup>[13]</sup> In our body, calcium absorption is a major determinant as it maintains calcium balance in the body and it's influenced by many factors that are present within us.<sup>[14]</sup> Hence, the main aim of this study is to evaluate the calcium level among pre- and postmenopausal women.

## MATERIALS AND METHODS

Patients were selected from those attending the Outpatient Department of Saveetha Dental College and Hospitals and divided into two groups. Group I consists of normal healthy menstruating women and Group II consists of postmenopausal women.

### Sample Collection

Informed consent was obtained from the patient before sample collection. 3 ml of venous blood was collected and distributed in plain collection tubes and centrifuged in 3000 rpm for serum. Then, serum was separated and analyzed to estimate the serum calcium level by standard kit method using CORALAB 3000 Semi Automated Analyzer.

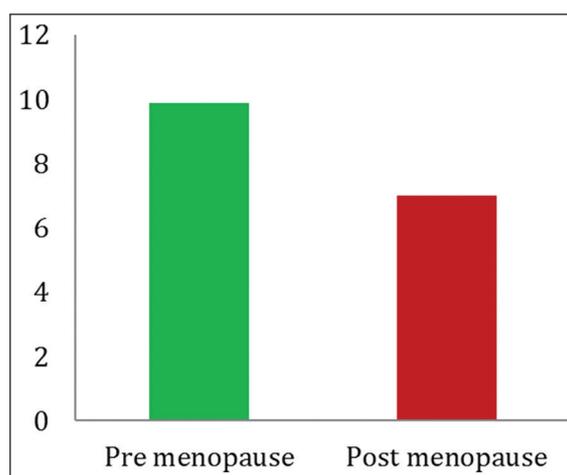
## RESULTS

All the data were analyzed using the SPSS package. Paired sample *t*-test analysis was done to find out

significant differences between the two groups. All the tests were considered statistically significant at  $P < 0.05$  level.

## DISCUSSION

From this study, we understand that there is a great decrease in bone mass due to low calcium level which will lead to hypertension, osteoporosis, and bone fractures [Figure 1]. Similar studies of Qureshi *et al.* also said that there is a decrease in calcium levels in postmenopausal women when compared to premenopausal women. We took an effective sample size of 30 and were analyzed to compare the calcium levels in pre- and post-menopausal women. Calcium levels are very less in postmenopausal women that were ( $<0.001$ ) statistically significant [Table 1]. Premenopausal women having normal calcium level but post menopausal women have reduced level so they may have to take vitamin supplements to boost up their calcium level. Calcium absorption is an important determinant of calcium levels and is influenced by many factors. Many previous year studies have identified that age, intake of protein, fat, and fibers and many hormones have some or the other effects on calcium levels in pre- and postmenopausal women.<sup>[14]</sup> Elevated bone mineral density is more prominent in postmenopausal women than in premenopausal women. Difference in the effect of adiposity on bone density between pre- and postmenopausal women.<sup>[15]</sup> Calcium functions as both of



**Figure 1:** Mean calcium level of pre- and post-menopause women

**Table 1: Calcium level of pre- and post-menopause women**

Groups	Calcium level Mean±SD	Paired <i>t</i> -test
Premenopause	9.87±0.60	<0.001 (statistically significant)
Postmenopause	7±0.78	

intake and absorption of calcium.<sup>[16]</sup> Very similar study of Tirtha *et al.* also has said that life of women after menopause is a very major issue in today's happening world as osteoporosis is greatly progressing in postmenopausal women that are causing many bone metabolic diseases. Calcium supplements can be taken for postmenopausal women as to increase or to compensate the loss of calcium levels in them as calcium supplements slowed down greatly the bone losses in postmenopausal women.<sup>[17]</sup> Bone mineral density is supported by food supplements and with vitamin supplements increase it a lot by many ways.<sup>[18]</sup>

## CONCLUSION

The overall effect of calcium level is more in premenopause women than postmenopause women. Dietary supplementation may be helpful for the postmenopausal women to avoid the risk of osteoporosis.

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