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ORIGINAL RESEARCH

Assessment of serum calcium level in post-menopausal women

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ABSTRACT:

Background: The process of bone loss starts at menopause which is 2-5% per year due to declining estrogens levels and is seen in the first 5-7 years after menopause. The present study was conducted to assess serum calcium level in post-menopausal women. **Materials & Methods:** 104 post-menopausal women (Group I) and equal number of pre- menopausal women was taken (Group II). A thorough clinical examination was done. 3-5 ml of venous blood was drawn aseptically from antecubital vein of each subject. Serum calcium level was estimated. **Results:** Age group 45-50 years had 15, 50-55 years had 23, 55-60 years had 25, 60-65 years had 20 and >65 years had 17 subjects. The difference was non- significant ($P > 0.05$). The mean serum calcium level in group I was 8.5 mg/dl and in group II was 7.2 mg/dl. The difference was significant ($P < 0.05$). **Conclusion:** Post-menopausal women exhibited significantly lower serum calcium level as compared to pre-menopausal women.

Key words: Pre- menopausal women, Serum calcium, Thyroid

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INTRODUCTION

Calcium ion is an essential structural component of the skeleton. Skeletal mineralization and rate of bone turnover are controlled by a number of hormones. In women the two major causes of bone resorption are oestrogen deficiency and age related processes.¹ The process of bone loss starts at menopause which is 2-5% per year due to declining estrogens levels and is seen in the first 5-7 years after menopause. Later age-related bone loss occurs at a rate of 1% per year affects the cortical and trabecular bone.²

Extracellular calcium ion concentration is determined by the interaction of calcium absorption from the intestine, renal excretion of calcium, and bone uptake and release of calcium, each of which is regulated by parathyroid hormone and Vitamin D and calcitonin. Bone mineralization and rate of bone turnover are controlled by a number of hormones in the body. Parathyroid hormone causes bone resorption and helps to maintain blood calcium level.³ Estrogen exerts a major effect in women on bone remodeling by inhibiting interleukin-6 production that reduces

bone resorption and also controls the timing of osteoclast apoptosis. Estrogen deficiency, therefore, results in a longer life span of osteoclasts. In female, at the age of 40-50 years, the monthly menstrual cycle becomes irregular, ovulation fails to occur during many cycles, and ultimately, there is cessation of the cycle which is called menopause.⁴ The present study was conducted to assess serum calcium level in post-menopausal women.

MATERIALS & METHODS

The present study comprised of 104 post-menopausal women (Group I). Equal number of pre- menopausal women was also taken (Group II). Consent from all enrolled subjects was obtained before starting the study.

Demographic profile comprised of name, age etc. Women having hypertension, diabetes mellitus, history of hormones replacement therapy, and fracture were excluded from the study. A thorough clinical examination was done. 3-5 ml of venous blood was

drawn aseptically from antecubital vein of each subject. The blood sample was collected clean plain labeled tube and transferred to laboratory for the estimation of calcium ion. Serum calcium was measured by colorimetry method using calcium (Arsenazo III) reagent. Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant.

RESULTS

Table I Distribution of subjects

Age group (Years)	Number	P value
45-50	15	0.18
50-55	23	
55-60	25	
60-65	20	
>65	17	

Table I shows that age group 45-50 years had 15, 50-55 years had 23, 55-60 years had 25, 60-65 years had 20 and >65 years had 17 subjects. The difference was non- significant (P> 0.05).

DISCUSSION

The period during which the female sexual cycle ceases and female sex hormones diminish rapidly to almost none at all is called Menopause. It occurs between 45-55 years of age. It is characterized by hot flushes, night sweats and various other psychological and biochemical changes occur. It also leads to metabolic bone disorders.⁵ With the onset of menopause, rapid bone loss occurs which is believed to average approximately 2% to 3% over the following 5 to 10 yrs, being greatest in the early postmenopausal years. Calcium ion is an essential structural component of the skeleton. Body can't synthesize it. There is growing evidence for the

importance of nutrition in the maintenance of bones and joints health. Nutrition imbalance with endocrine abnormalities may be involved in osteoporosis. Organ systems that play an import role in Calcium metabolism are Skeleton, Gastrointestinal tract and Kidney.⁶ Extracellular calcium ion concentration is determined by the interaction of calcium absorption from the intestine, renal excretion of calcium, and bone uptake and release of calcium, each of which is regulated by parathyroid hormone, vitamin D and calcitonin. Bone mineralization and rate of bone turnover are controlled by a number of hormones in the human body.⁷ The present study was conducted to assess serum calcium level in post-menopausal women.

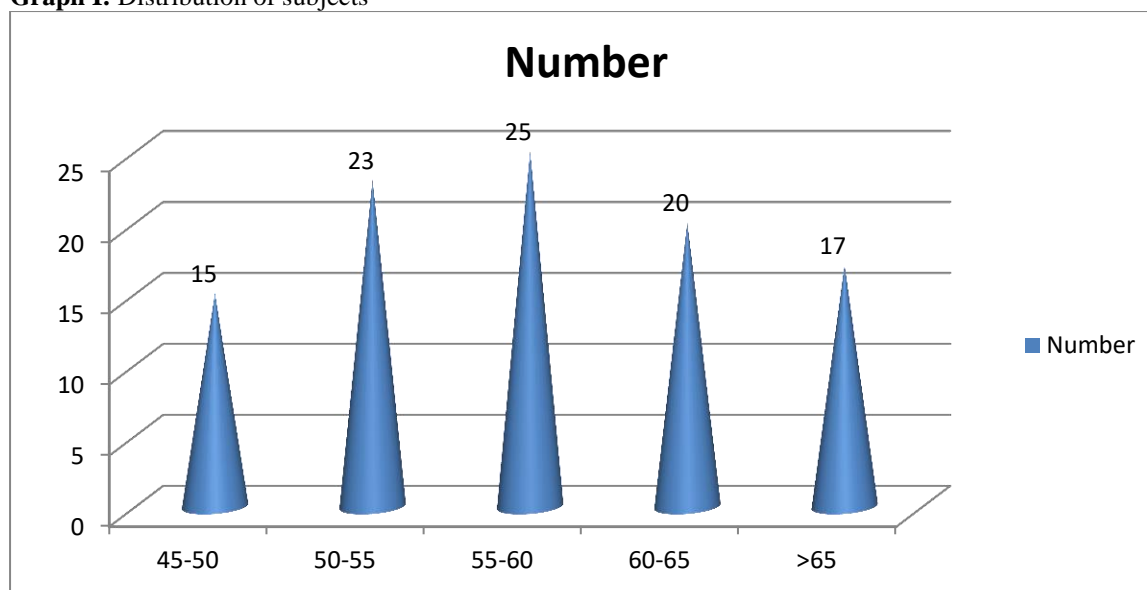
Table II: Assessment of serum calcium level

Groups	Mean	P value
Group I	8.5	0.01
Group II	7.2	

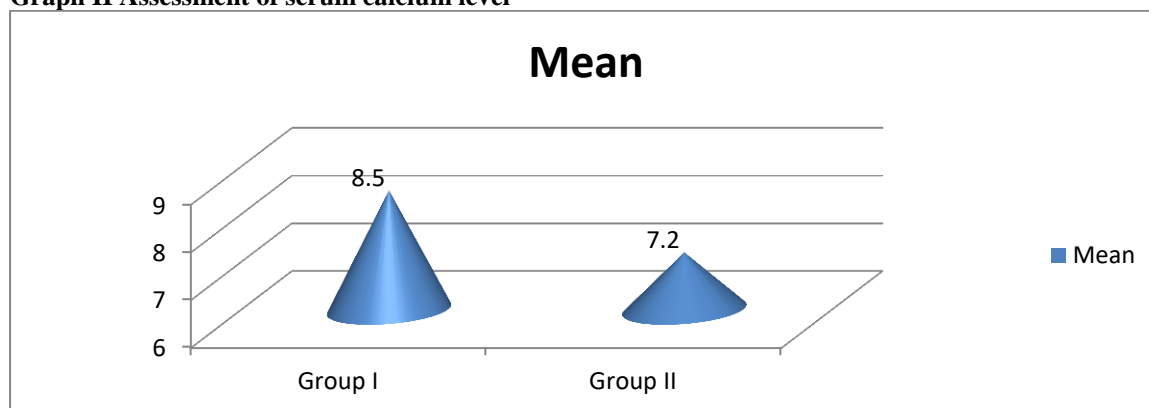
Table II, graph II shows that mean serum calcium level in group I was 8.5 mg/dl and in group II was 7.2 mg/dl. The difference was significant (P< 0.05).

In present study, age group 45-50 years had 15, 50-55 years had 23, 55-60 years had 25, 60-65 years had 20 and >65 years had 17 subjects. Bhale et al⁸ evaluated serum calcium status in pre-menopausal and postmenopausal women. A total of 30 pre-menopausal and 30 post postmenopausal women were included in this study. Serum calcium concentration will be measured by Dimension RxL fully automated analyzer using the kits supplied by Siemens. Serum calcium level was significantly deficient in post postmenopausal women than in pre-menopausal women.

Graph I: Distribution of subjects



Graph II Assessment of serum calcium level



We observed that mean serum calcium level in group I was 8.5 mg/dl and in group II was 7.2 mg/dl. Kumari et al⁹ conducted a cross-sectional study in 42 premenopausal and 58 postmenopausal women. Serum calcium level of each subject was determined. Mean serum calcium was significantly decreased in postmenopausal women compared to premenopausal women. Serum calcium level was significantly deficient in postmenopausal women than in premenopausal women. Meena Desai et al¹⁰ studied in Indian women found lower mean serum calcium and significant increase in IL-6 (Interleukin-6) in postmenopausal women than premenopausal women which is positively correlated with bone turnover markers and negatively with bone mineral density. These changes occurred in first 5 years after menopause, thus indicating that bone loss is confined to first decade of menopause. Hamid Javaid Qureshi et al¹¹ studied in Pakistan found significantly lower serum calcium and significantly higher serum parathyroid hormone levels in postmenopausal women indicating increase bone turnover compared to premenopausal women. Serum calcitonin level was not significantly different in the two groups. However some studies have shown higher/similar serum calcium levels in postmenopausal older women than premenopausal women. C.V. Harinarayan et al¹² studied Vitamin D and BMD from south India found Prevalence of osteoporosis was much lower in the young reproductive women than in postmenopausal women. However there was no significant difference found in serum calcium levels between both the groups.

CONCLUSION

Authors found that post-menopausal women exhibited significantly lower serum calcium level as compared to pre- menopausal women.

REFERENCES

1. Garton M, Martin J, New S, Lee S, Loveridge N, Milne J, . Bone mass and metabolism in women aged 45-55. *Clin Endocrinol (Oxf)* 1996;44:563-70.
2. Uebelhart D, Schlemmer A, Johansen JS, Gineyts E, Christiansen C, Delmas PD, et al. Effect of menopause and hormone replacement therapy on the urinary excretion of pyridinium cross-links. *J Clin Endocrinol Metab* 1991;72:367-73.
3. Harinarayan CV, Joshi SR. Vitamin D status in India - its implications and remedial measures. *J Assoc Physicians India* 2009;57:40-8.
4. Cappuccio FP, Elliott P, Allender PS, Pryer J, Follman DA, Cutler JA. Epidemiologic association between dietary calcium intake and blood pressure; A meta-analysis of published data. *Am J Epidemiol* 1995;142:935-45.
5. Bucher HC, Cook RJ, Guyatt GH, Lang JD, Cook DJ, Hatala R, et al. Effects of dietary calcium supplementation on blood pressure. A metaanalysis of randomized controlled trials. *JAMA* 1996;275:1016-22.
6. LeBoff MS, Kohlmeier L, Hurwitz S, Franklin J, Wright J, Glowacki J, et al. Occult vitamin D deficiency in postmenopausal US women with acute hip fracture. *JAMA* 1999;281:1505-11.
7. Wickham CA, Walsh K, Cooper C, Barker DJ, Margetts BM, Morris J, et al. Dietary calcium, physical activity, and risk of hip fracture: A prospective study. *BMJ* 1989;299:889-92.
8. Bhale DV, Ansari HA. Study of serum calcium levels in postmenopausal women of Aurangabad district. *Int J Recent Trends Sci Technol.* 2014;8:332-.
9. Kumari A, Kumari V, Kumar R, Rekha K. Study of Serum Calcium Level in Pre- and Post-menopausal Women of Jamshedpur, Jharkhand. *Int J Sci Stud* 2018;6(6):18-20.
10. Meena Desai, Mohammed Ikram Khatkhatay, Vijaya Taskar, Zakiya Ansari. Changes in Cytokines, Biomarkers of Bone Turnover and Hormones Are Associated With Bone Loss in Postmenopausal Indian Women. *Int J Endocrinol Metab.* 2012; 10(1):399-403.
11. Hamid Javaid Qureshi, Ghulam Hussain, Zafar Altaf Jafary, Muhammad Usman Bashir, Naghmana Latif, Zeeshan Riaz. Calcium status in premenopausal and postmenopausal women: *J Ayub Med Coll Abbottabad .* 2010; 22(2):143-5.
12. Harinarayan CV1, Sachan A, Reddy PA, Satish KM, Prasad UV, Srivani P. Vitamin D status and bone mineral density in women of reproductive and postmenopausal age groups: a cross-sectional study from south India. *J Assoc Physicians India.* 2011; 59:698-704.