Study of Serum Calcium Levels in Postmenopausal Women of Aurangabad District

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Research Article

Abstract: 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. It also leads to metabolic bone disorders and rapid bone loss. In postmenopausal women, estrogen deficiency may induce calcium loss by indirect effect on extra skeletal calcium homeostasis. **Objectives:** The objective of this study was to evaluate serum calcium status in pre-menopausal and postmenopausal women. **Materials and Methods:** Present Cross sectional study was carried out in the Department of Biochemistry and central Investigation Laboratory MGM Medical College and Hospital, Aurangabad during October 2012 to October 2013. 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. Statistical analysis was done using SPSS version 17 and student t test. **Result:** Serum calcium level was significantly deficient in post postmenopausal women than in pre-menopausal women.

Keywords: Serum Calcium Level, Postmenopausal, Aurangabad.

Introduction

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. 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.[1, 2] 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.[3] Organ systems that play an import role in Calcium metabolism are Skeleton, Gastrointestinal tract and Kidney. 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.[4] Bone mineralization and rate of bone turnover are controlled by a number of hormones in the human body. Parathyroid hormone (PTH) causes bone resorption and helps to maintain blood calcium levels. Estrogens exert a major effect in women on bone re-modelling by inhibiting interleukin (IL)-6 productions that reduces bone resorption and also controls the timing of osteoclast apoptosis. Estrogens deficiency, therefore results in a longer life span of osteoclasts.[5] Intestinal calcium absorption decreases in postmenopausal women.[6] The aim of present study was to evaluate calcium status in postmenopausal women.

Materials and Methods

Present Cross sectional study was carried out for duration of two years in the Department of Biochemistry and central Investigation Laboratory MGM Medical College and Hospital, Aurangabad during October 2012 to October 2013 after the permission from institutional ethical committee. A total of 30 post menopausal women and 30 normal controls (pre-menopausal women) were included in this study. All cases and controls chosen for the study were free from any other diseases like STDs, rheumatic fever, inflammatory bowel disease, neoplastic disease, renal failure and bacterial infection.

Collection of Blood sample

10ml fresh blood sample was aseptically collected from ante cubital vein of each subject, transferred into a clean plain labeled tube, allowed to clot, and then centrifuged at 6000 rpm for 5 minutes at room temperature. The clear serum was separated and kept at 20^0 C till assayed. The blood samples (3-5ml fresh blood) was aseptically collected from ante cubital vein of each subject, transferred into clean plain labeled tube, allowed to clot and then centrifuged at 6000 rpm for 5 minutes at room temperature. The clear serum was separated and kept at 20^0 C till assayed. Concentration of serum calcium was measured by Dimension RxL fully automated analyzer using the kits supplied by Siemens. The results obtained were analysed using student t-test with SPSS version 17.

Result

Serum calcium was significantly decreased (p=0.040) in post postmenopausal women as compared to that in pre-menopausal women. The mean values and standard deviation were calculated for comparative study of postmenopausal women (cases) and controls. The values of cases and control groups were also graphically represented for comparison. The graph shows significant decrease in Serum calcium level in subjects as compared to the controls. Table shows mean, standard deviation and p values of the study parameter in postmenopausal women (cases) and in pre-menopausal women (controls).

Table 1: showing the comparable values of postmenopausal women (cases) and Controls

Sr. No.	Parameter	Cases (n=30)		Controls (n=30)		p Value
		Mean	SD	Mean	SD	
1	Serum calcium mg/dl	8.80	0.26	9.22	0.72	0.040*

*statistically significant

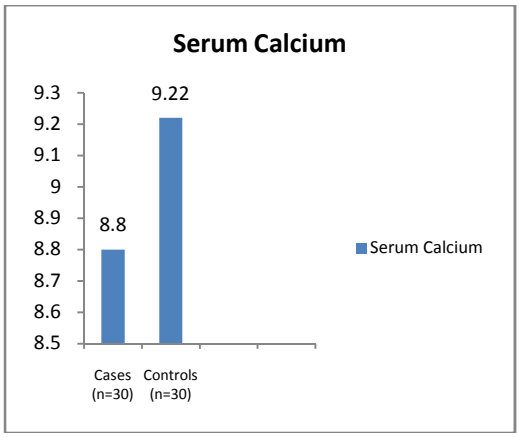

Figure 1: Showing comparison of Serum calcium in post postmenopausal women with pre-menopausal women

Discussion

Calcium status was evaluated in pre-menopausal and postmenopausal women in the present study. Postmenopausal women had significantly lower serum calcium levels than in pre-menopausal women. Declining ovarian function before menopause is accompanied by reduction in bone mass and altered calcium metabolism.[7] Oestrogen deficiency may induce calcium loss due to decreased intestinal calcium absorption and decreased renal calcium conservation[8, 9]. The characteristic feature of menopause is reduction in skeletal mass caused by an imbalance between bone formation and bone resorption due to loss of ovarian function. In support of this statement we in the present study observed low levels of serum calcium in postmenopausal women when compared to normal menopausal women. The same decrease in serum calcium in menopause was also observed by Lori J Sokoll *et al.* in their study on 402 menopausal women[10]. The low serum calcium might be due to increased urinary loss of calcium in post menopausal women. Estrogen deficiency may induce calcium loss due to decreased intestinal calcium absorption and decreased renal calcium conservation[8].

Conclusion

On the basis of the results of the present study, it may be concluded that Serum calcium level was significantly decreased in post postmenopausal women than in pre-menopausal women. . However, further studies are needed to evaluate the levels of calcium in post menopausal women.

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