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## RESEARCH ARTICLE

# COMPARITIVE STUDY OF SERUM CALCIUM IN SURGICAL & NATURAL MENOPAUSE

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### ABSTRACT

**Aims:** To compare levels of calcium in surgical menopausal women with that of women in natural menopause. **Objective:** To make women in menopause aware of risk factors associated of low calcium levels in this period. **Brief Methodology :** 50 women ageing (from 30 years to menopause) who have undergone hysterectomy with oophorectomy in last 1-2 years were included in **study** group. 50 women ageing between 45-55 years who were experiencing natural menopause since 1-2 years were included in **control** group. Calcium in centrifuged serum samples was analysed on Olympus AU 400 Autoanalyser using Transasia kits in central lab of GMC & JJ Mumbai. The statistical analysis was done by using ANOVA and the correlation was done by using the Pearson's correlation coefficient **Observations & Results:** Calcium levels in surgical menopausal women were significantly reduced as compared to those with women in natural menopause. **Conclusion:** Surgical menopausal women are at greater risk of suffering from after effects of decreased Calcium levels of which most common is osteoporosis. .

### INTRODUCTION

The term menopause is defined as the permanent cessation of menstruation resulting from the loss of ovarian follicular activity. Natural menopause is recognized to have occurred after 12 consecutive months of amenorrhea, for which there is no other obvious pathological or physiological cause.<sup>1</sup>

*Surgical menopause* is the cessation of menses resulting from surgical removal of the uterus , leaving one or both ovaries , or the removal of both ovaries.<sup>2</sup> Oestradiol levels in surgical menopausal women is significantly reduced as compared to those with natural menopausal women.<sup>3</sup> Surgical menopausal patients are associated with a greater risk of developing osteoporosis and cardio vascular, neurogenic and mental disorders due to hormonal imbalance.<sup>4</sup> Oestradiol has an influence over the calcium (Ca) metabolism; after hysterectomy, a drop in the oestrogen levels causes hypocalcaemia.<sup>5</sup>

**Aims :** To compare levels of calcium in surgical menopausal women with that of women in natural menopause.

**Objective :** To make women in menopause aware of risk factors associated of low calcium levels in this period.

### MATERIALS AND METHODS

The study group involved 50 early hysterectomy (from 30 years to menopause) while 50 women ageing between 45-55 years who were experiencing natural menopause since 1-2 years were included in control group. While selecting the test group, the patients suffering from cardiovascular disease, asthma, musculoskeletal disorders, genitourinary tract disorders, menstrual cycle disorders and endocrinal disorders were excluded from the study. The samples were collected from the GMC & JJ group of hospitals in Mumbai in study period of 2.5 years from January 2012 – July 2014 5ml of blood was collected from the median cubital vein under strict aseptic precautions. The samples were analysed by using a Olympus AU 400 chemistry auto analyzer. A clear written informed consent was taken from the patients. The statistical analysis was done by using ANOVA and the correlation was done by using the Pearson's correlation coefficient.

### OBSERVATION & RESULTS

Reference range for calcium was taken as 8.7 – 10.2 mg/dl as established by central lab JJ Hospital. Mean Calcium levels in all surgical menopausal women was 7.2968 ±0.3736. Mean Calcium levels in all natural menopausal women was 8.5273 ±0.3594. After applying chi-square test it was found that decrease in serum calcium levels in

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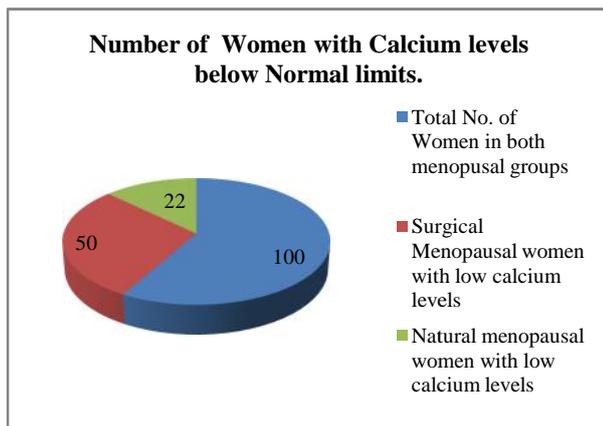
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surgical menopausal women was very significant( $p<0.001$ ) as compared to those in natural menopause.( $p>0.005$ )

**Table 1**

Parameter	Surgical Menopause	Natural Menopause
Mean Calcium levels	7.2968 ±0.3736	8.4273 ±0.3594
P value	$p<0.001$	$p>0.005$

Serum Calcium levels in all 50 surgical menopausal women was below normal limits ; whereas only 22 natural menopausal women were having calcium levels below normal limits i.e 8.7 mg/dl.



**Diagram1**

## DISCUSSION

The uterus is the target site for the action and the regulation of the female hormones, especially oestradiol. The presence of a functional uterus and ovaries is vital for the normal physiological functioning of the musculoskeletal system. Some studies have noted a three times greater risk of cardiovascular disease and also an increased risk of weakened bone in women with surgical menopause.<sup>6,7</sup> In surgically created menopausal patients many physiological and metabolic conditions are altered due to the decreased oestradiol concentration.<sup>4</sup> Hypocalcaemia is observed in surgical menopausal patients because

the oestradiol concentration is reduced after the removal of the uterus with ovaries. Oestradiol has a modulatory effect on the Ca metabolism. It is responsible for the entry of calcium into the bone matrix. A drop in the levels of oestradiol after surgical menopause can cause an excessive loss of calcium, leading to the wasting of bone and hence osteoporosis. An increased risk for bone fracture was also observed in the post hysterectomy patients.<sup>9,10,11,12</sup>

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## CONCLUSION

Surgical menopausal women are at increased risk of osteoporosis due to hypocalcemia as compared to those with natural menopause. Hence surgical menopausal women should be advised to undergo 6 monthly calcium analysis and also calcium supplementation under guidance of a physician.

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