

## Comparison of Serum Estradiol levels in Surgical and Natural menopause

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**Abstract:** Natural Meno pause is a normal physiological change in a woman's life which is marked by stoppage of menses for lasttwelve months. Surgical meno pause is the sudden stop page of menses brought about by operating procedures like hysterectomy. Women experincing natural meno pause go through a gradual change in hormonal levels. Women in surgical meno pause suffer from sudden hormonal imbalance and hence are more vulnerable to the symptoms like hot flushes, hypertension and cardio vascular disease. In this study estradiol levels were compared between the two groups. It was found that estradiol level in surgical meno pausal women was comparatively lower as compared to women in natural meno pausal group. This study was used to create awarness among the women of surgical meno pausal group about the sudden effects and changes they would be suffering from. So this group is the one which should be advised to take hormonal replacement therapy.

**Keywords:** Chemiluminescne, estradiol, natural menopause, surgiacal menopause.

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### I. Introduction

The ovary is a dynamic organ of female reproductive life and it undergoes many functional and morphological changes during a lifetime. During the reproductive years, ovaries secrete many hormones that are responsible for maintenance of normal menstrual cycle of women. Estrogen is secreted by theca and granulosa cells of graffian follicle and corpus luteum in ovary. Nobuaki Furuhashi et al[1] conducted a study on changes in Hypophysio-ovarian Endocrinological Function of Post-menopausal and surgical menopausal women ; and found that serum levels of estradiol were lower in surgical menopausal women as compared to normal menopausal women within 3 years .Bachmann G et al[2]conducted a study on physiologic aspects of natural and surgical menopause and found that in the surgically menopausal woman , estrogen and androgen levels are significantly reduced and so physiological changes associated with menopause occur more quickly as compared to normal menopausal women. Taylor . M et al[3] conducted a study on Psychological consequences of surgical menopause and found that loss of estrogenic and androgenic underpinnings may destabilize women with unstable psychiatric axes. Many symptoms are associated with the menopause , but which are usually the most significant and therefore most distressing to women are the hot flush and vaginal dryness. These symptoms are directly related to a decrease in estradiol levels and are experienced by over 70% of women. There has also been a suggestion that polymorphisms in the Estradiol synthesis and metabolism pathways are associatedwith women's vasomotor symptom experiences during the menopausal transition.[4,5]The purpose of our study is to create awareness among women who haveundergone surgical menopause that they are at higher risk of hot flushes, vasomotor symptoms, hypertension, cardiovascular diseases.

### 1. Introduction

Menopause is defined as that point in time when permanent cessation of menstruation occurs following loss of ovarian activity.[6]*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.[7]

### 2. Aim and objective

To study and compare hormonal levels of Estradiol inSurgical and Natural menopause.

### 3. Material and methods

A prospective study was carried out in the year 2013. The study included50 women (cases) belonging to surgical menopausal group and 50 women(controls) belonging to Natural meno pausal group. Women included in this study were women aging between 44 to 50 years who have undergone Total Hysterectomy in past one to two yearsand women agingbetween 44 to 50 years who are experiencing natural menopause since past one to two years. Women excluded from this study were those who were taking hormones in the form of drugs, suffering from endocrine disorders or ovarian tumors.

5 ml blood sample collected by venipuncture in plain tube which was then centrifuged at 4500 revolutions per minute for 5 minutes to obtain clear serum. Samples were then analysed on Immulite 1000 chemiluminescence machine.

The hormonal parameter Estradiol was measured by Solid Phase Competitive Chemiluminescent Enzyme Immunoassay. The solid phase (bead) is coated with rabbit anti-hormonal polyclonal antibody. The reagent contains alkaline phosphatase conjugated to respective hormone. This hormone-enzyme conjugate competes with respective hormone in patients blood sample for limited antibody binding sites on bead. The excess sample and reagent are removed by centrifugal wash. Finally chemiluminescent substrate is added to the bead and signal is generated in proportion to the bound enzyme. We used fully automated enzyme amplified chemiluminescent immunoassay based Immulite 1000 analyzer. Measurement of these blood hormonal parameters was done by using commercial kits from Siemens Medical Solutions Diagnostics, Los Angeles, CA, USA.

#### 4. FIGURES AND TABLES

Reference values in Postmenopausal women (as per Siemens diagnostic kit insert)

Table: 1

Hormonal Parameter	Reference values.
Estradiol	ND – 30 pg/ml

In this study the mean level of Estradiol hormone in study group was found to be  $10.72 \pm 2.30$  while that in control group was  $18.18 \pm 2.59$ . On applying independent (Unpaired) sample t – test, the difference in mean estradiol level between both the groups was found to be very significant with p value  $< 0.001$ . (Table 2)

Table no : 2				
Serum mean Estradiol Level of surgical and natural menopausal females				
Menopause	N	Mean E2 [pg/ml]	Standard Deviation [pg/ml]	Standard Error [pg/ml]
Surgical	50	10.72	2.304	0.326
Natural	50	18.18	2.593	0.367
Mean Difference= 0.49 [pg/ml]				
Independent Sample t test:- t value -15.2, df-98, p value <0.001				

## II. CONCLUSION

In current study, subjects of surgical menopause were having significantly lower levels of serum estradiol than in natural menopausal women. These findings were supported by Nobuaki Furuhashi et al[1] and Farhana Kabir et al[8] who also reported significant difference between estradiol levels of surgical and natural menopausal women. Bachmann G et al[2] revealed similar findings by reporting that in surgical menopausal woman, estrogen and androgen levels were significantly decreased and so physiological changes associated with surgical menopause occur quickly as compared to natural menopausal women. In natural postmenopausal women by the time when the ovaries cease to produce estradiol, it is produced in a number of extragonadal sites mainly in adipose tissue, but still estradiol levels are much below than their levels in premenopausal period[9]. It is speculated that these production from extragonadal sites starts around 12-18 months later in surgical menopausal women as they all are at much younger age than natural menopausal women[10]. On the other hand small amount of estrogen and androgens are still being produced by ovary in natural menopausal women[11] and also there is gradual decrease of estradiol in natural menopause[12] which may be responsible for comparatively lower estradiol levels in surgical menopausal women than in natural menopause. Gradual decrease of serum estradiol levels especially after the age of 45 years may be responsible for some features of metabolic syndrome such as abdominal obesity, insulin resistance, dyslipidemia and hypertension [13].

In this study we have found that serum estradiol levels in surgical menopausal women is low as compared to that in natural menopausal women. Probably this hormonal imbalance may be a reason behind increased risk of metabolic syndrome in surgical menopausal women. So this group of women should be advised to take hormone replacement therapy.

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