

# Post Ligation Syndrome / Menstrual Disorders after Tubal Ligation

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## Abstract

**Objectives:** The objective of the study was to compare the hormonal profile in women, who had undergone bilateral tubal ligation and those without tubal ligation.

**Study Design and Setting:** Cross- sectional Comparative Study carried out in the Gynecology department, Unit-I Jinnah Hospital, Lahore for a period of 6 months (July-Dec 2011)

**Results:** The mean age was recorded as  $34.55 \pm 0.67$  and  $33.99 \pm 1.02$  in group A (with BTL) & B (without BTL) respectively. Comparison of hormonal levels was analyzed in both groups, where the mean values of FSH, LH and Estradiol in Group-A were found as  $8.1 \pm 0.27$  IU/l,  $6.9 \pm 0.24$  IU/l and  $54.3 \pm 0.34$  ng/ml while in Group-B it was found as  $6.8 \pm 0.26$  IU/l,  $6.1 \pm 0.28$  IU/l and  $51.7 \pm 0.31$  ng/ml in Group-B respectively, which was statistically insignificant. P Value  $\leq 0.05$ .

**Conclusion:** The rate of ovulation after bilateral tubal ligation is found slightly improved after the procedure but ovarian reserves are not negatively affected.

**Key words:** Bilateral tubal ligation, ovarian reserves, hormonal profile.

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## Introduction

Surgical advances have resulted in safe, less invasive female sterilization procedures when childbearing is no longer desired. Of these, half are performed postpartum and half are ambulatory interval procedures. More than 190 million couples worldwide use surgical sterilization as a safe and reliable method of permanent contraception.

Tubal sterilization is the most commonly used method of family planning worldwide and in Pakistan also.<sup>1</sup> Changes in menstrual pattern after tubal sterilization have been reported for more than 50 years. Hence all tubal surgeries have been suspected of altering the

ovarian reserve, by damage to the ovarian blood vessels.<sup>2</sup> Although some recent studies have shown that tubal surgery has no significant adverse effect on doppler flow indices and hormonal markers, yet the controversy persists.<sup>3-5</sup>

Tubal ligation has been blamed for causing luteal phase defect as a result of an effect on ovarian circulation. There are variable research results on this issue. In a study by Dede et al, the rate of ovulation was slightly improved after the procedure, and ovarian reserve was not negatively affected. Bipolar electro-coagulation of the fallopian tubes did not alter the ovarian reserve and function. The 12 months follow-up

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of patients suggests that there is neither a decrease in ovarian reserve nor an adverse effect on the blood supply of ovarian stroma after tubal sterilization<sup>6</sup>, whereas Kelekci et al<sup>7</sup> observed a significant elevation of FSH levels at 1 and 12 months after BTL.

The existence of a post-tubal-ligation syndrome of menstrual abnormalities has been debated for decades, and the evidence is inconclusive.<sup>8</sup> Peterson et al,<sup>8</sup> conducted a large follow-up study to determine whether the likelihood of persistent menstrual abnormalities was greater among women who had tubal sterilization than among women who had not; they concluded that there was no difference between the groups in the likelihood of persistent menstrual abnormalities. Westhoff and Davis<sup>9</sup> concluded that the procedure is highly effective and safe. Harlow et al<sup>10</sup> found no significant change in menstrual cycle characteristics and hormone levels among women with tubal sterilization.

Cattanach and Milne<sup>11</sup> reported that women might experience abnormal uterine bleeding and/or menorrhagia and psychological problems after tubal sterilization and that tubal sterilization may lead to reduced ovarian function.<sup>12</sup> The concerns about early menopause and more menstrual distress after tubal sterilization were investigated further. Data based on the self-reports of college-educated women age 40–44 years at the time of reporting, i.e., of premenopausal age, indicated that women in this age group with tubal sterilization had a significantly higher risk of menopausal symptoms than did women in this age group with no tubal sterilization.<sup>13</sup>

The objective of the present study was to compare the hormonal profile in women, who had undergone bilateral tubal ligation and those without tubal ligation.

## Methodology

Cross- sectional Comparative Study carried out in the Department of Gynaecology, Unit - I, Jinnah Hospital, Lahore for a period of 6 months (July-Dec 2011). Sampling technique was non probability and Purposive Sampling.

### Inclusion Criteria:

- ♦ **SUBJECTS:** Women aged 20-44 years, having 2 or more children & undergone BTL for more than 6 months.
- ♦ **CONTROLS:** Women aged 20-44 years, with same parity, without BTL

### Exclusion Criteria:

- ♦ **SUBJECTS-** Patients having uterine fibroids or any other endometrial or ovarian pathology, diagnosed on USG or previous investigations.
- ♦ **CONTROLS-** Patients taking hormonal contraceptives, using IUCD, having uterine fibroids, evidence of pregnancy or ovarian pathology (confirmed on previous investigations).

### Data collection Procedure

The study subjects (group A) fulfilling inclusion and exclusion criteria were collected from OPD, ward as well as from a family planning clinic. Similarly, the controls (group B) were also taken from Gynae OPD, ward and family planning clinic. The women of same age and parity were included in controls. Purpose of the study was explained to them and informed consent was taken. The complete history of the patient was taken. Five ml of blood sample was drawn under the aseptic condition and sent to a lab for estimation of FSH, LH and Estradiol levels. All data was recorded on attached proforma.

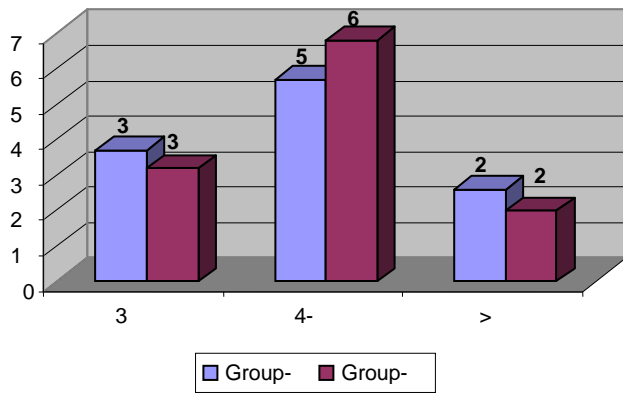
The collected data was entered into SPSS version - 11 and descriptive statistics were calculated. The relevant variables of the study include age, parity, years elapsed after tubal ligation and hormonal levels. Since all these variables are quantitative in nature, these are presented as Mean  $\pm$  SD.

## Results

In this study, a total of 240 patients were recruited after fulfilling the inclusion/exclusion criteria to compare the hormonal profile in women, who had undergone bilateral tubal ligation and those without tubal ligation.

In this study, table no. I shows the distribution of the patients according to their age group, the mean age was recorded as  $34.55 \pm 0.67$  in Group-A and  $33.99 \pm 1.02$  in Group- B, respectively. Figure 1 shows parity distribution.

Table No I: Age Distribution of The Subjects				
Age in years	Group-A (n=120)		Group-B (n=120)	
	No. of cases	%	No. of cases	%
20-30	23	19.17	19	15.83
31-40	64	53.33	73	60.83
41-44	33	27.5	28	23.34
Mean +S.D	$34.55 \pm 0.67$		$33.99 \pm 1.02$	
Total	120	100	120	100



**Figure 1. Parity Status**

Table no. II describes the years elapsed after tubal ligation in patients with BTL (Group-A). In this table 50% (n=60) had tubal ligation one year back, 16.7% (n=20) with 2 years, 23.3% (n=28) with three years and only 10% (n=12) had BTL for >3 years.

Table no II: Years Elapsed After Tubal Ligation		
Years	Group-A (n=120)	
	No. of cases	Percentage
1	60	50
2	20	16.7
3	28	23.3
>3	12	10
<b>Total</b>	<b>120</b>	<b>100</b>

Comparison of hormonal levels is analyzed in Table no. III, where the mean values of FSH, LH and Estradiol in Group-A were found as  $8.1 \pm 0.27$  IU/l,  $6.9 \pm 0.24$  IU/l and  $54.3 \pm 0.34$  ng/ml respectively, while in Group-B similar levels were found as  $6.8 \pm 0.26$  IU/l,  $6.1 \pm 0.28$  IU/l and  $51.7 \pm 0.31$  ng/ml in Group-B respectively, which was statistically insignificant (Table No. III) P Value  $\leq 0.05$ .

Table no III: Comparison of Hormonal Levels			
Hormonal levels	Group-A	Group-B	P Value
	Values in mean	Values in mean	
FSH	$8.1 \pm 0.27$ IU/l	$6.8 \pm 0.26$ IU/l	$\leq 0.05$
LH	$6.9 \pm 0.24$ IU/l	$6.1 \pm 0.28$ IU/l	
Estradiol	$54.3 \pm 0.34$ ng/ml	$51.7 \pm 0.31$ ng/ml	

## Discussion

Tubal sterilization is the most commonly used method of family planning. Questions regarding the existence of a post tubal ligation syndrome of menstrual abnormalities continues. Many authors have investigated the sequelae of female sterilization.<sup>14-19</sup> Increased premenstrual distress, heavier and more

prolonged menstrual bleeding, and increased dysmenorrhea have been reported.<sup>18</sup> However, failure to control for use of oral contraceptives, age, obesity, parity, interval since sterilization, or type of sterilization may have effects on the results of these studies.<sup>15,20</sup>

Sterilization has been hypothesized to cause menstrual abnormalities by adversely affecting ovarian function. However, laboratory studies comparing women before and after sterilization have found no consistent abnormalities in ovarian function.<sup>21</sup> Tubal occlusion has been hypothesized to disrupt the ovarian blood supply. Although the tubal branch of the uterine artery, which is often occluded during sterilization, connects with the ovarian branch of the uterine artery, blood is also supplied to the ovary by the ovarian artery, which could not be affected by sterilization because it branches directly off the aorta and is remote from the occlusion site. Alternatively, tubal occlusion might cause an acute increase in pressure in the utero-ovarian arterial loop, damaging the ovary.<sup>22</sup> However, nearly all studies that controlled for prior contraceptive use,<sup>21</sup> including a study,<sup>23</sup> found no menstrual changes two years after sterilization, and it is unlikely that acute damage to the ovary would neither alter hormonal status nor lead to symptoms within several years. However, the debate about a post-tubal-ligation syndrome has persisted not only because the syndrome has been ill defined, but also because many women are observed to have menstrual abnormalities after sterilization.

Because of the importance of this debate, we compared the hormonal profile in women, who had undergone bilateral tubal ligation and those without tubal ligation.

In our study, comparison of hormonal levels shows that FSH, LH and Estradiol in Group-A were found statistically significant higher but these values are not very higher to the normal values of FSH, LH and Estradiol. Menstrual problems were noted in about 60% of patients. These problems were noted more in age group 33-43 yrs and more in patients who have tubal ligation >3yrs ago. Menstrual problems were noted in about 60% of patients. These problems were noted more in the age group 33-43 yrs and more in patients who have tubal ligation >3yrs ago.

Our results are in agreement with a study by Dede et al<sup>24</sup>, Fagundes ML et al<sup>25</sup> and Cevrioglu AS et al<sup>26</sup> where the rate of ovulation was slightly improved after the procedure, and ovarian reserve was not negatively affected. Bipolar electrocoagulation of the fallopian tubes did not alter the ovarian reserve and function. Kelekci et al<sup>27</sup> concludes that 12-month follow-up of

patients suggests that there is neither a decrease in ovarian reserve nor an adverse effect on the blood supply of ovarian stroma after tubal sterilization while a significant elevation of FSH levels at 1 and 12 months after BTL was seen.

In Pakistan, among 30 percent of contraceptive prevalence, female sterilization is the most common method in almost 8%, and 2% of married women reported using the IUD, injectables and the pill. In Pakistan no such study has ever been conducted regarding hormonal levels of patients after tubal sterilization, but two studies were conducted on the relation of gynaecological and menstrual problems associated with tubal ligation.<sup>28-29</sup>

During the study period, there were various limitations regarding patient compliance, cost effectiveness, limited back-up and collection of reports.

## Conclusion

The rate of ovulation after bilateral tubal ligation is found slightly improved after the procedure but ovarian reserves are not negatively affected.

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