

## A Histopathological Study of Endometrium in Infertility

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**Abstract:** Infertility is defined as inability of couple to achieve conception after one year of unprotected coitus. The purpose of investigation is to assess chance of achieving pregnancy and to identify treatable factors. In spite of many investigatory tools available, endometrial histology is a sensitive indicator of ovarian function. Aim of the study is to determine cause of infertility by morphological pattern of endometrium, to assess importance of luteal phase defect and to determine incidence of Tuberculous endometritis as an etiological factor. Study was carried out in the Pathology Dept. M.G.M. Medical college, Jamshedpur. The study included 79 endometrial biopsies with complaint of infertility. Routine histopathological processing and staining was done with hematoxylin and eosin. Out of 73 cases of primary infertility, 21.92% were in proliferative phase, 65.75% were in secretory phase. Luteal phase defect was found in 8.22% and just 1.37% cases were reported as tuberculous endometritis. In developing countries like India, histopathological study of endometrium forms an important, safe, and cheaper diagnostic tool in cases of primary and secondary infertility where expensive, immunological and hormonal assays are not easily available or affordable.

**Keywords:** Endometrium, Hematoxylin Infertility, Tuberculous endometritis,

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### I. Introduction

Infertility has become a medical as well as social problem. This can cause intense agony and trauma to the infertile couple. There is a huge stigma attached to being infertile and it has negative implications in Indian society, especially for women. It is assumed that the desire to have a child is normal and parenthood is the part of the natural order of things. In ordinary course sexually mature male and female, after a short period of conjugal life beget a child and complete the nature's cycle of reproduction. When couple fails to conceive, then they are branded as infertile. The incidence of infertility varies from region to region. Out of ten approximately one marriage is barren(1). In India around 10.2 million couples are infertile(2). Infertility affects both men and women equally. About one third of the cases are due to male factor, one third to the female and the remaining to the combination of both partner.

#### Infertility has been defined as:

1.WHO(World Health Organization)- Infertility is defined as no conception after at least 12 months of unprotected intercourse.

2.Current definition: Failure to conceive following one year of unprotected intercourse if under 35 years of age or 6 months if over 35.

Infertility may be further classified as primary infertility, in which no previous pregnancies have occurred and secondary infertility, in which a prior pregnancy, although not necessarily a live birth, has occurred(3). Sterility implies an intrinsic inability to achieve pregnancy, where as infertility implies decrease in the ability to conceive(4). Investigation for infertility should be started as early as possible, when couple arrives with complaint of infertility. The age factor is important as the day specific probability of conception declines with age. An association between the age of a woman and reduced fertility has been well documented. The decline in the fecundability begins in the early 30s and accelerates during the late 30s and early 40s. Therefore investigation and treatment should be undertaken as early as possible. Many investigatory tools are available to diagnose the infertility but the endometrial biopsy remains the gold standard investigation. Endometrial biopsy is a sensitive indicator as it reflects the ovarian function. It also gives information about other pathological lesions leading to infertility.

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Glycogen and metabolic products are important as it serves as a source of energy for developing and maintaining an embryo(5). When endometrium fails to produce adequate amount of glycogen, it gives rise to condition in death of ovum either before or after implantation. This leads to sterility or habitual abortion. The present study has been taken to study abnormalities in endometrium in case of infertility.

## II. Material And Methods

The present study was carried out in the Department of Pathology, M.G.M. Medical college Jamshedpur. The present study is a prospective analysis of 79 endometrial biopsies received in the Department of pathology from Obstetrics and Gynaecology Department of M.G.M. Medical College, Jamshedpur and other adjacent clinics. The patients with complaints of infertility (primary or secondary) were included in the study. Detailed clinical history regarding menstrual cycle, Last Menstrual period, age at marriage and obstetric history in case of secondary infertility were obtained. Tissue of endometrial biopsy was fixed in both formal saline and alcoholic formaldehyde(6). After fixation tissue was grossly examined for any abnormalities. Tissue was processed, paraffin blocks were made and 5-6 micron thickness of sections were cut. The sectioned were stained with Hematoxylin and Eosin(7). The stained sections was studied for morphology of endometrium and dating of the endometrium. Special stain (Ziehl Neelson stain) were used for the detection of acid fast bacilli in case of granulomatous endometritis.

## III. Results

The various morphological patterns of endometrium in infertility patients belonging to secretory phase, proliferative phase and simple cystic hyperplasia were documented in the present study. In a total of 79 endometrial biopsies studied, 73 (92.40%) cases belonged to primary infertility and the remaining 6 (7.60%) cases to secondary infertility (Table -1). In present study a total of 79 cases were studied. Out of which 72 cases were primary infertility and 6 cases were of secondary infertility. Majority of cases belonged to primary infertility. All secondary infertility cases have a previous history of conception.

**Table 1:** The different type of Infertility patient

Type of infertility	Number	Percentage
Primary	73	92.4
Secondary	6	7.6
Total	79	
Inference	Majority of cases are of primary infertility.	

Data pertaining to age distribution in different infertile patients were given in Table -2. The youngest patient seen was 21 years old and eldest was 40 years in primary infertility. The youngest patient seen was 26 years old and eldest was 38 years in secondary infertility.

**Table 2:** Distribution of cases according to age

Age group (years)	Primary infertility		Secondary infertility	
	No.	%	No.	%
21- 25	15	20.54	----	----
26-30	21	28.76	2	33.33
31-35	26	35.61	3	50
36-40	11	15.08	1	16.66
Total	73	100	6	100

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Data pertaining to distribution of cases according to duration of infertility is given in Table 3. In Primary infertility maximum number of cases 65 (89.04%) belong to 1-5 years of duration of infertility followed by 8(10.96%) cases belong to 6-10 years of infertility. In Secondary infertility out of 6 cases 4 (66.67%) patients belong to 1-5 years of infertility and 2 cases (33.33%) belong to 6-10 years of infertility.

**Table 3:** Distribution of cases according to duration of infertility

Duration of infertility (years)	Primary infertility		Secondary infertility	
	No.	%	No.	%
1-5	65	89.04	4	66.67
6-10	8	10.96	2	33.33
11-15	----	----	----	----
Total	73	100	6	100

**Table 4:** Histological diagnosis in primary and secondary infertility

Histological diagnosis	Primary infertility		Secondary infertility	
	No.	%	No.	%
Secretory endometrium	48	65.75	2	33.33
Proliferative endometrium	16	21.92	2	33.33
Luteal phase defect	6	8.22	1	16.67
Simple cystic hyperplasia	2	2.74	--	--
Tuberculous endometritis	1	1.37	1	16.67
Total	73	100	6	100

**IV. Discussion**

The present study consists of 79 cases of infertility, out of which 73 were of primary infertility and 6 cases were of secondary infertility. In the present study, incidence of primary infertility was 92.40% and secondary infertility was 7.60%. Jhaveri et al (1972)(8) and MP Zawar (2002)(9) have reported incidence of primary infertility 80.25% and 77.7% respectively while that of secondary infertility was 19.75% and 22.5% respectively in their series of cases. The incidence of secondary infertility has been found to be less than the incidence of secondary infertility in similar study done previously. It may be due to widespread prevalence of small family norm, where couple being satisfied by a single child.

The maximum number of cases of infertility (34.25%) was found to fall in age group of 31-35 years, which was slightly higher than previous studies. It may be due to the fact that the present study being done on patients in Medical college, which being an apex institute of the state of the Kolhan region receives most of the referral cases.

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In primary infertility group 89.04% patients came in 1-5 years of duration of infertility. In secondary infertility group 66.67% of women presented themselves for investigation of infertility after 1-5 years of secondary infertility. Now a days duration of infertility has decreased due to the introduction of in vitro fertilization and various assisted reproductive technologies. Human endometrium is the site, where nidation of young fertilized ovum takes place. Well developed follicle and efficient corpus luteum make the endometrium favourable for the successful implantation of blastocyst and continuation of pregnancy. The present study evaluated the adequacy of endometrial development based on correlating menstrual history with glandular and stromal morphology. Anovulatory cycle is the commonest cause of infertility in present series. Anovulatory cycle was seen in 22.78% cases. The present study was compared with previous studies done by other author.

**Table – Comparison of percentage of ovulatory and anovulatory endometrium**

Author & year	percentage of anovulatory endometrium	percentage of ovulatory endometrium
Shetty(1959)(10)	15.2	74.8
Gupta et al (1980)(11)	22.8	68.5
Sareen(1984)(12)	19	79
Jadhav & Raichur(1987)(13)	25	75
Sabharwal BD(1987)(14)	12	84
Krishnamohan et al (1993)(15)	10	87.5
Neil Shastrabudhe(2001)(16)	34.2	62.36
Zawar MP (2002)(9)	28.2	67.4
Present study	22.78	63.30

The luteal phase defect is diagnosed by using Jone’s (1976) criteria. Luteal phase defect may be the cause of infertility in ovulatory cycle. Wentz AC(17), Michael Soules(18). and Arup Kumar(19) found luteal phase defect in 19%.16% and 5% of infertility patients respectively. In present study luteal phase defect was found in 8.86% cases. This luteal phase defect can be diagnosed by measuring serum progesterone level. The serum progesterone level is lower than 10ng/ml one week prior to the start of menstruation or 7 days after the LH surge in luteal phase defect.

**Table- Comparison of luteal phase defect in ovulatory endometrium.**

Author & year	luteal phase defect in percentage
Driessen F((1980)(20)	27
Gupta et al (1980)	8.1
Sareen(1984)	39

Krishnamohan et al (1993)	7.5
Neil Shastrabudhe(2001)	15.8
Zawar MP (2002)	20
Present study	8.86

Cystoglandular hyperplasia was seen in 2.53% of cases in present study. Gupta et al, Sabharwal, Krishnamohan and Shastrabudhe found endometrial hyperplasia in 5.9%, 2.66%, 2.5% and 4.4% respectively. This endometrial hyperplasia may be due to long standing follicular persistence, repeated anovulatory cycle and high level of unopposed estrogen. Tuberculous endometritis formed a minor cause of infertility in the present study. It was found in 2.53% cases of infertility. The incidence of tuberculous endometritis has been found to be reduced when compared with the similar previous study. This may be due to the widespread availability of treatment for tuberculosis.

**Table-** Comparison of percentage of tuberculous endometritis

Author & year	Comparison of percentage of tuberculous endometritis
Gupta et al (1980)	1.5
Sareen(1984)	2
Shastrabudhe(2001)	2.6
Zawar MP (2002)	2.6
Present study	2.53

In the present study PAS stain was done in 75 cases of infertility. This stain helps in the assessment of glycogen content. This glycogen plays an important role for the proper implantation and subsequent growth of fertilized ovum in the uterus. Glycogen should be present in the glandular secretion in adequate amount. High content of glycogen serve as a major source of energy for maintaining an embryo. Sharma S(21), Gupta PL(22) and Zawar MP found glycogen deficiency in 28.5%, 52% and 30% of infertility patients respectively. A Histopathological Study of Endometrium in Infertility

### V. Conclusion

The present study was done on 79 women presenting with the complaint of infertility (primary and secondary infertility). Endometrial biopsies were taken in all cases and gland & stroma were studied histologically. Maximum number of patients (87.34%) presented themselves for the investigation of infertility after 1-5 years of marriage. Common age group for infertile women was 31-35 years. Maximum number of cases (22.78%) of infertility were found to be due to anovulatory cycle. Glycogen deficiency was seen mainly in the luteal phase defect indicating histopathologic immaturity of endometrium. This immature endometrium prevents implantation of the fertilized ovum and subsequent development of fetus. Histopathological study of endometrium forms an important, safe and cheaper diagnostic tool in cases of primary and secondary infertility.

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