

## Histopathological Study of Endometrium in Cases of Infertility

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Received date: June 01, 2015; Accepted date: April 26, 2016; Published date: April 28, 2016

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### Abstract

A study of 50 cases of primary and secondary infertility was carried out in the department of pathology NIMS Medical College Jaipur. Endometrial specimens were evaluated in the light of menstrual history to find out the incidence of various endometrial changes in cases of infertility. All cases underwent endometrial biopsy premenstrual. Haematoxylin and eosin staining was done for dating of endometrium and diagnosis of corpus luteal defect and anovulatory cycles. PAS was also done. Menstrual problems were seen in 38% of patients. Anovulatory infertility was present in 28% cases. Luteal phase defect was seen in 20% cases. Cystoglandular hyperplasia was seen in 6% cases & tuberculous endometritis was present in 2.0% cases. Glycogen deficiency was seen in 30% cases of luteal phase defect.

**Keywords:** Infertility; Endometrium; Anovulatory infertility; Haematoxylin

### Introduction

Infertility is worldwide problem. Approximately one marriage in ten is barren, Sophia [1]. In India there are an estimated 10.2 million couples of infertility, dawn [2]. The purpose of investigating the infertile couple is to assess their chance of achieving a pregnancy and to identify the factors amenable to treatment. In spite of many investigatory tools available endometrial histology is a sensitive indicator of ovarian function. Premenstrual endometrial biopsy plays an important diagnostic role in cases of infertility.

### Materials and Methods

Endometrial biopsies of 50 cases of primary and secondary infertility were received in department of pathology, NIMS medical college, Jaipur, during the period of June 2013 to June 2014. Detailed clinical history regarding menstrual cycle, last menstrual period, age at marriage and obstetric history was obtained. Clinical examination was carried out in each case. Premenstrual endometrial biopsy specimens were obtained.

The material was processed and paraffin embedded sections of 5 microns were cut. Haematoxylin and eosin stained sections were studied to date the endometrium accurately based on the criteria describe by Dallenbach Hellweg [3].

Periodic acid Schiff staining was done in 50 cases & 25 normal controls to detect the amount of glycogen. PAS positivity was graded as nil, scanty, moderate and abundant arzac and blanchet [4]. The findings were analysed to find out the incidence of various changes in infertile endometrium.

### Observation

Amongst 50 cases of infertility 37 cases (74%) were of primary infertility, 13 (26%) cases were of secondary infertility.

The maximum numbers of patient were in the age range of 21-30 years. The youngest patient was 18 years old and the oldest was 40 years. In primary infertility group 40% patient came in 2-3 years duration of infertility. In secondary infertility group 38.46% patients came in 6-7 years duration after last conception.

Menstrual problems were seen in 8 (21.62%) cases of primary infertility and 3 (23.08%) cases of secondary infertility. Irregular menses were seen in 14 (37.84%) cases of primary infertility & 5 (38.46%) cases of secondary infertility. 50 endometrial specimens were analysed for the incidence of changes in endometria (Table 1).

Histological diagnosis	Primary infertility no of cases 155	%	Secondary infertility no of cases 45	%
Normal secretory endometrium	23	62.16	9	69.23
Proliferative (anovulatory) endometrium	11	29.73	3	23.08
Cystoglandular hyperplasia	2	5.40	1	7.69
Tuberculous endometritis	1	2.70	-	-

**Table 1:** Incidence of changes in endometria.

Anovulatory endometrium was seen in 11 (29.7%) cases of primary infertility and 3 (23.08%) cases of secondary infertility. 1 case of primary infertility showed endometrial tuberculosis. Zeihl neelsen staining for AFB was negative in all 1 case (Table 2).

The glycogen content was graded as follow arzac & blanchet:

- O - Negative reaction
- + - Very small granules
- ++ - Coarse granules
- +++ - Small masses

++++ - Large masses

Glycogen Content (Pas Staining)	Proliferative Phase 15 Cases		Secretory Phase 20 Cases		Luteal Phase Defect 15 Cases	
	Primary	Secondary	Primary	Secondary	Primary	Secondary
0	11	3	-	-	-	-
+	-	-	-	-	3	1
++	-	-	1	-	4	1
+++	-	-	2	1	-	-
++++	-	-	8	1	-	-
Total	11	3	11	2	7	2
Grand Total	14		13		9	

**Table 2:** Histology and glycogen content in the endometrium of patient with infertility.

## Discussion

Human endometrium is important site in nidation in young fertilized ovum, myaema [5]. Present studies evaluated the adequacy of endometrial development based on correlating menstrual history with glandular & stromal morphology.

Adequate follicular development & functionally efficient corpus luteum formation are the essential prerequisites for the preparation of good endometrial bed which is essential for successful implantation of blastocyst & continuation of pregnancy [6].

The diagnosis of luteal phase defect was made by using jone's criteria [7]. According to him luteal phase defect is defined as lag more than two days in histological development of endometrium compared to the day of cycle.

Histopathological abnormalities in the form of anovulatory endometrium and luteal phase defect formed major cause of infertility in present series and observed by other authors (Table 3)

	% of anovulatory endometrium	% of ovulatory endometrium
Shetty (1959) [8]	15.2	74.8%
Gupta et al. (1980) [9]	22.8	68.5%
Sareen (1984) [10]	19	79%
Jadhav and raichur (1987) [11]	25	75%
Sabharwalbd (1987) [12]	12	84%
Krishnamohan et al. (1993) [13]	10%	87.5%
Neil shastrabudhe (2001) [14]	34.2%	62.3%
Present study (2002)	28.2%	67.4%

**Table 3:** Histopathological abnormalities in the form of anovulatory endometrium and luteal phase defect.

Anovulatory cycles are quite common in cases of infertility. In present study anovulatory endometrium was present in 28.2% cases. The secretory phase of endometrium in the premenstrual period is indicative of ovulation and thus it rules out anovulation as a cause of infertility. Luteal phase defect may be the cause of infertility in ovulatory cycles. In present study luteal phase defect was, seen in 20% cases. Wentz ac [15,16], Soules M [17], and Kumar A found luteal phase defect in 19%, 16% and 5% of infertility patients respectively.

Tuberculous endometritis and cystoglandular hyperplasia formed a minor cause of infertility in present studies. Rani PR [18] found that in patients of genital tuberculosis, the most common site of involvement is endometrium in 46.6% cases. Manjiri [19] and Kumar A [20], Nagpal M [21] found endometrial involvement in 86.66%, 50% and 60% respectively in patient of genital tuberculosis. Nandita B [22] and Tripathy [23] found the endometrial tuberculosis present with complaint of infertility in 79.04% and 58% respectively (Table 4).

Author & year	% of tuberculous endometritis
Zawar et al.	2.6%
Sathe et al.	6%
Schaefer	5.1%
Gupta et al. [24]	8.7%
Sareen [10]	2%
Sabharwal [12]	1.34%
P. Chakorborty	6.2%
R. Mishra	4.9%
Shastrabudhe N [14]	2.6%
Present study	2%

**Table 4:** Incidence of tuberculous endometritis in present series observed by other a uthor.

The endometrial hyperplasia due to excess level of estrogen can also prevent pregnancy. In present study cystoglandular hyperplasia was seen in 1.8% of cases (Table 5).

Author & year	Glycogen deficiency in %
Zondek and stein	18.4%
Shetty [8]	44.6%
Zawar et al.	30%
Anshu et al.	24.7%
Rohtangi	22.5%
Sareen [10]	39%
S. Sharma [25]	28.5%
Present study	28.13%

**Table 5:** Glycogen deficiency as a cause of infertility observed by various authors.

Gupta et al. [9], sabharwal [12], Krishnamohan [13] and shastrabudhe [14] found hyperplasia in 5.9%, 2.66%, and 4.4% respectively.

In present study, PAS stain was done in 50 cases of infertility to assess the amount of glycogen content. For the proper implantation and subsequent growth and development of fertilized ovum in the uterus. It is necessary that adequate amount of carbohydrate in general and glycogen in particular should be present in the glandular secretions. In the endometrium the high glycogen content of these glands serve as a major source of energy for maintain an embryo.

## Conclusion

Histopathological study of endometrium forms an important safe and cheaper diagnostic tool in cases of primary and secondary infertility.

In present study anovulatory endometrium and luteal phase defect formed etiological basis of many cases in infertility. In the present studies of glycogen deficiency seen mainly in the luteal phase defect indicating histopathological immaturity of endometrium.

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