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HISTOMORPHOLOGICAL STUDY OF ENDOMETRIUM IN CASE OF INFERTILITY: A STUDY OF 50 CASES

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ABSTRACT

Infertility is defined as one year of unprotected coitus without conception. Primary infertility applies to those who have never conceived, whereas secondary infertility designates those who have conceived sometime in the past. In spite of many investigatory tools available, endometrial biopsy remained the most important tool as endometrial histology is a sensitive indicator of ovarian function. The present study was conducted in the department of pathology of NKP Salve Institute of Medical Sciences and Research Centre, Nagpur. Fifty specimens of endometrial biopsy received from females with complaints of infertility (both primary and secondary) who reported in the department of obstetrics and gynecology were included in the study. In the present study various endometrial abnormalities like anovulatory endometrium and luteal phase defect were noted which formed etiological basis of many cases of infertility. Endometrial tuberculosis and hyperplasia formed a minor group of cases. Observing the glycogen deficiency is also useful. In the present study glycogen deficiency is mainly seen in the luteal phase defect, concluding that the cause of glycogen deficiency is secondary to histopathologic immaturity of endometrium.

Key Words: Endometrium; Histomorphology; Infertility

Introduction

There are many biological causes of infertility, some of which may be bypassed with medical intervention.¹ During the child bearing age, the normal endometrium undergoes a series of sequential changes in the course of the ovulatory cycle that prepare it to receive the ovum. If the ovum is not fertilized, the endometrium is cast off by menstruation, and the cycle repeats itself. A normal endometrial cycle is associated with changes in both endometrial glands and stroma that allow the pathologist to date the endometrium.² The purpose of endometrial biopsy is to assess the synchrony between the endometrium and the day of the menstrual cycle. Adequate follicular development and functionally efficient corpus luteum formation are the essential prerequisites for the preparation of good endometrial bed which is essential for successful implantation of blastocyst and estimation of pregnancy.³

The schedule of evaluation or investigations in infertility range from detailed clinical history, physical examinations, basal body temperature, vaginal cytology, cervical mucus changes, endometrial biopsy, laparoscopy, ultrasonography, follicular study, hormone assays to immunoglobulin profile and new genetics.⁴ However, the most reliable method for diagnosing the cause of infertility in women remains the histopathological study of endometrial tissue.⁵

There are various causes of infertility but the causes which will affect endometrial lining and causing infertility are anovulatory cycle, luteal phase defect, endometrial hyperplasia, tuberculous endometritis, adenomyosis, endometriosis etc. The endometrium will change phase from proliferative to secretory if ovulation has occurred. A defect is present if the maturation of the endometrium lags behind the chronological duration of the cycle by more than two days. About 40% of the cases of female infertility are due to ovulatory failure, about 40% due to endometrial or tubal diseases, about 10% are due to rare causes and about 10% remain undefined after full workup.⁶

Materials and Methods

The present study was conducted in the Department of Pathology at tertiary care Centre, Nagpur. Fifty specimens of endometrial biopsy received from females with complaints of infertility (both primary and secondary) who reported in the Department of Obstetrics and Gynaecology were included in the study. Detailed clinical history regarding menstrual cycle, last menstrual period, age at marriage and obstetrics history was recorded on proforma attached. Endometrial biopsies were processed by paraffin processing and sections of five microns were cut. Haematoxylin and eosin stain was used primarily to study the sections to date the endometrium accurately based on the criteria described by Dallenbach and Hellweg.⁵ Periodic acid Schiff's (PAS) staining was done in secretory phase endometrium to detect the amount of glycogen, as high glycogen content of endometrial glands serves as a major source of energy for maintaining an embryo. PAS positivity was graded according to Arzac and Blanchet⁷ as nil, scanty, moderate and abundant and was analyzed to find out the incidence of various changes in the endometrium of infertile women. Ziehl-Neelsen staining was also done in cases presenting with history of tuberculosis or history of treatment of tuberculosis. The data was analysed and statically compared using chi square test.

Results

The observations of the present study are summarized below.

Type of infertility: There were 37(74%) cases of primary infertility and 13(26%) cases of secondary infertility.

Age: In primary infertility maximum patients i.e. 16 (43.25%) cases belonged to 23-27 years. In secondary infertility maximum patients i.e. 5(38.46%) belonged to 28-32 years.

Duration of infertility: Maximum patients i.e. 18(48.65%) cases amongst the primary infertility group came with 2-4 years duration of infertility. In secondary infertility group maximum patients i.e. 5(38.46%) cases came within 5-7 years duration of infertility.

Menstrual pattern: Twenty three (62.16%) cases of primary infertility and 8(61.54%) cases of secondary infertility had regular menstrual cycles. The menstrual abnormality in the form of irregular cycles was seen in 8(21.64%) cases of primary infertility and 3(23.08%) cases of secondary infertility. In primary infertility other menstrual complaints in the form of menorrhagia, oligomenorrhoea and polymenorrhoea were 2(5.40%), 2 (5.40%) and 2(5.40%) respectively. Similarly, in secondary infertility oligomenorrhoea and polymenorrhoea was found in 1(7.69%) and 1(7.69%) respectively.

Clinical Symptomology: 21 (56.76%) cases of primary infertility and 7(53.85%) cases of secondary infertility were asymptomatic. 14 (37.84%) cases of primary infertility and 5 (38.46%) cases of secondary infertility had menstrual complaints. Dyspareunia 2 (5.4%) was also found in cases of primary infertility, while prolapse was found in 1 case (7.69%) of secondary infertility.

Histopathology of endometrium: Secretory endometrium was seen in 23 (62.16%) cases of primary infertility and 9(69.23%) cases of secondary infertility.

Luteal phase defect was noticed in 7(77.78%) cases of primary infertility and 2(22.22%) cases of secondary infertility.

Anovulatory cycles were seen in 11(29.73%) cases of primary infertility and 3(23.08%) cases of secondary infertility.

Endometrial Tuberculosis: This was found in 1 (2.7%) case of primary infertility.

Endometrial Hyperplasia: Cystoglandular hyperplasia was seen in 2 (5.4%) cases of primary infertility and 1 (7.69%) case of secondary infertility.

Glycogen Content: Glycogen content study was carried out in 36 cases of primary and secondary infertility. Glycogen deficiency was found in all 9 cases of luteal phase defect i.e. 18% cases of the study group. Mild deficiency of glycogen was found in 5 (55.55%) and severe deficiency was found in 4 (44.44%). Anovulatory endometrium, showed absence of glycogen.

Histomorphological study of endometrium forms an important diagnostic tool in cases of primary and secondary infertility.

	Primary	Secondary
Type of infertility	37	13
Age (In Years)	23-27	28-32
Max. duration of infertility (In Years)	2-4	5-7
Menstrual Pattern		
• Regular	23	8
• Irregular cycles	8	3
• Menorrhagia	2	0
• Oligomenorrhoea	2	1
• Polymenorrhoea	2	1
Clinical Symptomology		
• Asymptomatic	21	7
• Menstrual complaints	14	5
• Dyspareunia	2	0
• Uterovaginal prolapse	0	1
Histopathology of Endometrium		

• Secretory Endometrium	23	9
Luteal Phase Defect	7	2
Anovulatory Cycle	11	3
Endometrial Tuberculosis	1	0
Endometrial hyperplasia	2	1

Discussion

The purpose of investigating the infertile couple is to assess their chance of achieving a pregnancy and to identify factors amenable to treatment, Driessen⁸.

Walleh⁹; Rameshkumar and Thomas¹⁰; Peterss et al¹¹, Sahmay et al¹² concluded that endometrial study is safe, reproducible and adequate means of providing histologic evidence of normal endometrial development.

In infertility cases endometrial biopsy performed shortly before or at the beginning of menstrual bleeding plays an important role Driessen F⁸.

The endometrial curettage is an essential step in the examination of infertile women as it is the most sensitive indicator of ovarian function. It provides an opportunity to examine the target tissue for effect of estrogen and progesterone (Chang and Soules)¹³.

Conclusion

Histomorphological study of endometrium forms an important diagnostic tool in cases of primary and secondary infertility.

In the present study various endometrial abnormalities like anovulatory endometrium and luteal phase defect were noted which formed etiological basis of many cases of infertility. Endometrial tuberculosis and hyperplasia formed a minor group of cases.

Observing the glycogen deficiency is also useful. In the present study glycogen deficiency is mainly seen in the luteal phase defect, concluding that the cause of glycogen deficiency is secondary to histopathologic immaturity of endometrium.

We conclude that histomorphological study of endometrium forms an important easy, safe and cheaper diagnostic modality in cases of infertility.

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