

## ENDOMETRIAL GLYCOGEN - AN IMPORTANT PARAMETER OF INFERTILITY

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### SUMMARY

In the present study 200 cases were selected, 150 of infertility and 50 of proved fertility. Endometrial biopsies were taken in premenstrual phase in 125 and in postmenstrual phase in 25 cases of infertility group and 25 each in control group.

Histochemically, endometrium was retarded in 52% in infertility group as compared to 16% in control.

Histologically the endometrium showed mild glycogen in 45%, moderate 43.33%, heavy 8.33% and intense 3.33% in infertility group in secretary phase as compared to control it was moderate in 14.28%, heavy 28.57 and intense in 57.14% cases. In postmenstrual phase the glycogen was mild in 96%, moderate to heavy in 68% heavy to intense in 32% in control group. This study shows significant decrease glycogen deposition in endometrium in infertility cases in postmenstrual as well as in premenstrual phase. This study suggests that deficiency of glycogen in the endometrium plays an important role in infertility.

### INTRODUCTION

Infertility is always an important problem for the women but never considered an urgent one. In advancing medicine,

assisted reproduction technology has greatly increased the hope of an infertile couple but all these methods are time consuming and expensive and are associated with low pregnancy rate (15-20%). The success of these methods depends upon multiple factors, one of them is

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adequate priming of endometrium to receive the fertilized ovum. Glycogen plays an important role in it. The nutrition of an egg from its ovulation, transport, fertilization and finally its implantation in the uterus is provided by glycogen.

#### MATERIAL AND METHOD

The study was conducted in the department of Gynae & Obst. J.L.N. Medical College, Ajmer. 200 Cases were selected. 150 of infertility & 50 of proved fertility, 120 were primary and 30 of secondary infertility. Endometrial biopsies were taken in premenstrual phase in 125 and in post menstrual phase in 25 infertility group and 25 each in control group. The samples stained with H & E and PAS reagent with or without digestion with saliva for histochemical study of glycogen.

Glycogen was graded mild (+) moderate (++) Heavy (+++) & Intense (++++).

(1) **Mild (+)** Small amount of glycogen in early & mid proliferative phase. Distribution is perinuclear & particles are small.

(2) **Moderate - (++)** In early secretory phase glycogen particles are supranu-

clear. Mild to moderate PAS +ve material around blood vessels.

(3) **Heavy - (+++)** In late secretory phase large amount of glycogen in lumen of glands.

(4) **Intense (++++)** Predecidual cells also showed moderate amount of glycogen.

#### RESULT

Duration of infertility varied from 2 to 11 yrs and age distribution was 17 to 30 yrs. The menstrual cycles were regular in 68.66% and irregular in 31.34% in infertility group as compared to 82% & 18% respectively in control group.

Histologically, endometrium was in secretory phase in 48% in infertility group (Table I). The glycogen was mild in 45%, moderate 43.33%, heavy 8.33% and intense in 3.33% only in infertility group (Table II). In control group endometrium was in secretory phase in 84% and the glycogen was moderate in 14.28%, heavy 28.57% and intense in 57.14% (Table III).

In postmenstrual phase the glycogen was mild in 96%, moderate to heavy in 4% cases in infertility group as compared to

Table I

Relation of endometrial biopsy to menstrual phase

Group of cases	No. of Biopsies	Phase of Cycle		Histo : Phase	
		Post Menstrual	Pre Menstrual	Proliferative	Secretory
Control	50	25	25	29	21
Primary Infertility	120	20	100	78	42
Secondary Infertility	30	5	25	12	18



Table II

## Endometrial glycogen in infertility

Type of Endometrium	Total Cases	Mild Glycogen		Moderate Glycogen		Heavy Glycogen		Intense Glycogen	
		No.	%	No.	%	No.	%	No.	%
Proliferative	90	63	70	27	30	-	-	-	-
Early Secondary	32	16	26.6	14	23.3	2	3.3	-	-
Late Secretary	28	11	18.3	12	20.0	3	5.0	2	3.3

Table III

## Endometrial glycogen in control cases

Type of Endometrium	Total Cases	Mild Glycogen		Moderate Glycogen		Heavy Glycogen		Intense Glycogen	
		No.	%	No.	%	No.	%	No.	%
Proliferative	29	19	65.5	7	24.1	3	10.3	-	-
Early Secondary	9	-	-	1	4.7	3	14.2	5	23.8
Late Secretary	12	-	-	2	9.5	3	14.2	7	33.3

mild in 68% and heavy to intense in 32% in control.

**DISCUSSION**

Satisfactory maintenance of the reproductive process depends upon the intricate function of various endocrine glands, effect of hormones and enzymes. The nature's most complex problem is to furnish ever-increasing amount of food stuff to the ovum after it leaves the Graffian follicle, is fertilized and implants itself on the surface of the endometrium.

Essential nutrients for these vital cells includes many substances, particularly oxygen and glycogen which determines the receptivity of the endometrium to the fertilized ovum.

The endometrial biopsies were retarded in 52% in infertility group as compared to 16% in control group. Higher incidence of retarded endometrium in infertility was also observed by Jhaveri et al (1972) and Banerjee et al (1973). The glycogen deposition in endometrium was decreased in infertility cases as compared to control.

Similar observations were also reported by Hughes (1945), Maeyama et al (1977), Abbasi et al (1977). Zondek et al (1940) detected glycogen deficiency in 18.4% cases of infertility and termed this condition as glycopenic uterus.

Various factors responsible for low glycogen deposition has been suggested. Low level of glycogen splitting enzyme (Hughes (1945), defective oxidation & utilization of glycogen (Payne et al (1955) may lead to environment, detrimental to the blastocyte. Stueriner et al (1952) suggested that amount of glycogen becomes more in secretory phase as there is shift from predominantly anaerobic glycolysis during proliferative phase to predominantly aerobic glycolysis in secretory phase. Decreased level of oestrogen and progesterone are responsible for the decreased deposition of glycogen in the endometrium, decreased permeability of cell membrane & no leakage of glycogen or glucose in the uterine fluid has been suggested by Hughes et al (1969) & Hackl (1971)

#### CONCLUSION

In some cases both the partners are

normal anatomically and physiologically, still the woman fails to conceive. This study suggests that deficient synthesis and deposition of glycogen in endometrium plays an important role in such cases.

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