

Endometrial Changes in Spontaneous and Clomiphene Induced Cycles - A Transvaginal Sonography Study

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Summary : A prospective study was conducted in department of Gynaecology, Baroda Medical College during the year 1993-94 to study the endometrium in spontaneous and clomiphene induced cycles. 133 cycles were studied in spontaneous group in 50 patients and 168 cycles were studied in induced group of 70 patients. It was observed that, endometrium showed a lag of at least 1 mm in induced cycle as compared with spontaneous cycle. Classical triple line appearance was observed in 68% of spontaneous cycles and in 48% of induced cycle. Preovulatory endometrial thickness was 11 mm in spontaneous as compared 8 mm in induced group.

Introduction

With the advent of high resolution transvaginal sonography, more and more attention is now directed towards study of endometrium in various phases of menstrual cycle. Early reports described endometrium as a prominent cavity central echo with no other endometrial feature due to poor resolution of ultrasound machine. The typical findings of endometrium in proliferative and secretory phases of the cycle have been described. The appearance of endometrium as gestational sac described as ovulation ring has been used as another sign for predicting ovulation on sonography. The endometrium in secretory phase has been described as hyperechoic and homogeneous.

Material and Methods

A controlled prospective study was conducted in the department of Obstetrics and Gynaecology of Baroda Medical College during the years 1993-94 to study the endometrium in spontaneous and clomiphene induced cycle by transvaginal sonography. A Philip's machine DR 1550 x R with 7.5 MHz probe was used for the study. The patients attending gynaec outpatient department with normal pelvic findings and not ovulating spontaneously were classified as Group A. Patients attending OPD with normal pelvic findings and not ovulating were classified as

Group B. All group B patients were given clomiphene citrate 50 mg for five days from day 2 to day 6 of menstrual cycle. All the patients were subjected to serial transvaginal sonography from seventh day on alternate days till follicular diameter was 16 mm. After that it was carried out daily, during each visit follicular dynamics and endometrial changes were noted. Statistical indices in the form of Chi Square Test were applied and P value of 0.05 was considered significant.

Analysis and Discussion

Table - 1
Endometrial Thickness (mm)

Days of Cycle	Spontaneous		Induced	
	(n)	(n)	(n)	(n)
7	5.55	(89)	4.23	(101)
8	5.85	(97)	4.70	(81)
9	7.14	(70)	5.89	(94)
10	7.66	(86)	5.99	(80)
11	8.71	(82)	7.51	(86)
12	8.78	(65)	7.80	(89)
13	9.67	(59)	8.18	(76)
14	9.97	(43)	9.00	(42)
15	11.20	(31)	10.27	(40)
16	11.54	(27)	10.53	(16)
17	11.89	(10)	10.62	(7)
18	12.00	(6)	10.92	(2)

n = no. of cases

A comparison of endometrial growth of spontaneous and induced cycle shows that endometrial growth shows a lag of more than 1 mm on an average in induced cycles for corresponding cycle length. Table I. The data were found to be statistically significant (P 0.01).

Table - II

Preovulatory Endometrial Thickness

Day Relative to Ovulation	Endometrial Thickness (mm)			
	Group - A (Spontaneous)		Group - B (Induced)	
	(n)		(n)	
-5	6.3	(94)	5.3	(96)
-4	7.4	(106)	6.1	(112)
-3	7.6	(90)	6.5	(98)
-2	8.1	(96)	7.0	(120)
-1	11.2	(101)	7.6	(126)
0	11.22	(104)	8.0	(124)

n = no. of patient χ^2 0.05

Table - III

Mean Endometrial Thickness & Follicular Diameter (mm)

Mean Follicular Diameter (mm)	Mean Endometrial Thickness (mm)	
	Spontaneous n - 133	Induced n - 168
9	4	3
12	5	4
15	7	6
19	7	6
20	9	7
22	11	8
24	11	8

Table II compares the endometrial thickness measurement on day of ovulation and upto 5 preceeding days. Endometrial thickness at the time of ovulation in induced cycles was 8 mm much less as compared to 11.22 mm in spontaneous cycle. Gonen et al (1989) have reported mean endometrial thickness of 4 - 6 mm on day 5 to 7 - 11 mm at ovulation.

Table III shows the correlations of endometrial thickness with the follicular diameter. The average endometrial thickness was 9 mm in spontaneous cycle when the follicular diameter was 20 mm. This corresponds with the study presented by Rajan et al (1990). But in induced cycles the endometrial thickness was 7 mm when follicular diameter was 20 mm showing lag of atleast 1 mm when

compared to spontaneous cycles. It indicates that follicular diameter does not reflect its steroidogenic function in clomiphene induced cycle.

Table IV
Triple Line Endometrium

	Spontaneous	Induced
	n = 133	n = 168
No. of cycle with Triple line Endometrium	90 (67%)	81 (48%)

The Table IV shows triple line endometrium was demonstrated in 67% of spontaneous cycles as compared to 48% of induced cycles. The decreased incidence of triple line endometrium in induced cycles as compared to that in spontaneous cycles also suggests possible role of clomiphene citrate on endometrium which still remains controversial.

Conclusion

The study concludes that

1. There is endometrial lag of minimum 1 mm when spontaneous and induced cycles are compared.
2. Endometrial lag also persists in induced cycles when it was related with follicular diameter.
3. Incidence of triple line endometrium is less in induced cycle.
4. The above conclusions suggest that there is some role of clomiphene on endometrium, may be direct or indirect.
5. At present there is no absolute agreement on usefulness of monitoring endometrial changes in spontaneous and stimulated cycles. Though it provides additional, quick and simple orientation regarding phase of menstrual cycle. Further research is required so as to explain the difference in endometrial findings in spontaneous and clomiphene induced cycles.

References

1. Gonen Y, Robert F, Casper, William Jalobson, Joshep Blankier, Fertil. Steril. 52 : 446, 1989.
2. Rajan, R, Rajan : J. of Obst. and Gyn of India : 40;476;1990.