

## FOLLICULAR IMAGING FOR OVULATION IN 68 INFERTILE WOMEN

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### SUMMARY

The detection and timing of ovulation is an important step in evaluation and management of female infertility. A total of 68 infertile women who underwent follicular imaging were analysed. Women with spontaneous cycle monitoring were 14 and induced cycle monitoring were 54 in number. The menstrual cycles evaluated were 21 and 134 cycles in spontaneous and induced groups. It was found that the average dominant follicle size in both groups were 18.7mm and 20.7mm and rate of growth per day was 3.1mm and 3.6mm respectively after day 10 onwards. The maximum size was seen on day 13 of menstrual cycle in 82% of monitored cycles. Multi follicular stimulation were seen in 53.7%. A pregnancy rate of 20.4% (14 pregnancies out of 68 cases) was seen.

Daily ultrasound ovulation monitoring is a good non-invasive method for better outcome in the treatment of infertility.

### INTRODUCTION

The detection and timing of ovulation is an important step in evaluation and management of female infertility. Ultrasound is a relatively new imaging technique that allows repeated non-invasive examination of the ovaries and related pelvic structures. The possibility of visualising details of ovarian structures on USG was first postulated by Kratochwil and colleagues in 1972. (Hackeloe & Sallam, 1983)

### MATERIAL AND METHOD

This study was carried out at the Infertility Clinic of Kasturba Medical College, Manipal

(Karnataka). A total of 68 infertile patients were selected for follicular imaging and evaluation. All these cases had no other apparent factor for infertility except ovulation problems.

The machine used was a linear ultrasound with 3.5 MHz transducer. A full bladder is a pre-requisite for a good acoustic window. The presence of the follicle can be confirmed by making transverse scans, starting just above the symphysis pubis and moving cephalad. Daily evaluation was done from Day 11 of the menstrual cycle.

The follicular measurement was done by taking the maximum diameter.

Follicular rupture was made out by one or more of the following ways:

- (1) Disappearance of the follicle.
- (2) Appearance of Internal echoes.
- (3) Collapse of the follicle with crenation of edges.

#### ANALYSIS

**TABLE I : DISTRIBUTION OF PATIENTS**

	Spontaneous	Induced	Total
No. of patients	14	54	68
No. of cycles	21	134	155

**TABLE II : INDICATION FOR INDUCTION (N=54)**

Anovulation	40
L P D	14
Total	54

**TABLE III : AVERAGE SIZE AND RATE OF GROWTH OF DOMINANT FOLLICLE**

	Spontaneous N=14 Pts.	Induced N=54 Pts.
Size (in mm)	18.7	20.7
Rate of growth/day (in mm)	3.1	3.6

**TABLE IV : MULTI FOLLICULAR STIMULATION IN CLOMIPHENE CYCLES N=54**

Cycle	No.	Percentage
1	16	55.1
2	7	24.0
3	1	3.4
4	2	6.8
5	3	10.3
Total	29	53.7

**TABLE V : PREGNANCY RATE**

	Spontaneous N=14	Induced N=54	Total N=68
Number	2	12	14
Percentage	15.0	22.2	20.4

Of the 68 Infertile women who underwent follicular imaging, 14 women through 21 cycles with spontaneous cycles and 54 women through 134 cycles with induction by clomiphene citrate were analysed (Clomiphene was given at a dose of 50 mg. from 5 to 9). Thus a total 155 cycles were evaluated (Table I).

It was shown that in the spontaneous cycle the average size of the follicles was 18.7mm with 3.1mm per day increase for the dominant follicles. In those with induced cycles the average size was 20.7mm with a rate of increase by 3.6mm/day (Table III). The maximum size was reached on day 13 or 14 in spontaneous cycle and D 12 or 13 in induced cycles.

Multi follicular stimulation in clomiphene induced cycles was observed in 29 out of 54 cases (53.7%). Higher incidence of multifollicular stimulation was seen in the first and second cycle of 55.1% and 24.0% whereas later on the incidence was less (Table IV).

The pregnancy rate was 20.4%, with 15% in spontaneous cycle and 22.2% in clomiphene induced cycles (Table V).

#### DISCUSSION

The 'Dominant' follicle cannot be differentiated from its fellow follicles until day 8 to 12, at which time the size and the rate of growth of the dominant follicles exceeds that of the remainder. Sub-ordinate follicle, may continue to grow but rarely exceed 14mm in diameter. In the clomiphene induced cycle, the average growth rate in the later follicular phase for the largest follicle is faster than the spontaneous cycle (But-

terly et al, 1983; O'Herlihy et al, 1982). Butterly et al (1983) have shown that in the Clomiphene induced cycles the largest follicle may not necessarily be the most mature or the one that contains the highest level of estrogen.

Table VI showing maximum follicular diameter (mm) in spontaneous and induced cycle shows varied maximum size of follicle by different authors (Decherney and Laufer 1984)

**TABLE VI: MAXIMUM FOLLICLE SIZE IN SPONTANEOUS AND INDUCED**

	Author	No. of Cycles	Max. Diameter(mm)
Spontaneous	Hackeloer	15	20
	O'Herlihy	54	20
	Renaud	27	18
	Bryce	14	25
	Kerin	-	23
Clomiphene Cycle	Butterly	203	15-23
	O'Herlihy	28	18-24
	Smith	20	25
	Vargyas	31	20-24

With LH surge, the thecal tissue becomes hypervascular and edematous and the granulosa cell layer begins to separate from the thecal cell layer. By USG this is recognised by the appearance of a line of decreased reflectivity around the follicle. This is seen within 24 hours of ovulation. Another sign seen in 20% of follicles is a small echogenic area projecting into the follicle which represents the cumulus oophorus. Ovulation occur within 36 hours.

### CONCLUSION

With daily USG, ovulation can be demonstrated in more cases and is a good non-invasive method for better outcome in the treatment of infertility.

### REFERENCES

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