# BASAL (DAY 2) SERUM FSH LEVEL - AN INDICATOR OF OVARIAN RESPONSE IN INFERTILE WOMEN

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## SUMMARY

**This prospective study was undertaken to evaluate the role of basal serum FSH level as an indicator of ovarian response in infertile women. Basal (day 2) serum FSH of 120 infertile women attending Manipal Assisted Reproduction Centre (MARC) was determined. These women were recruited for ovarian stimulation with sequential clomiphene citrate and hMG or pure FSH followed by intra-uterine-insemination of sperms in the same cycle. Seven women did not turn up for follow up hence were excluded from the study. Based on basal serum FSH values women were grouped among three categories as follows - Category I (<5 mIU/ml), Category II (5 - 10 m IU/ml) and Category III (>10 mIU/ml). High basal serum FSH levels were accompanied with poor responsse in terms of number of follicles. 75% of the women had <3 follicles in category III. The percentage of mature follicle (leading follicle > 18 mm), was more in category I (82%) and that of immature follicles (follicle < 14 mm) was more in category III (25%). Endometrial response was poor in category III (69% with endometrium < 8 mm).**


## *INTRODUCTION*

Basal FSH and Estradiol (E2) are useful markers of ovarian reserve. Outcome in any ovulation induction is strongly dependent on ovarian responsiveness to exogenous stimulation. Predictors of this responsiveness provide the physician with valuable

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information. One such indicator may be the basal FSH level. The serum level of FSH increases as ovarian function declines (Goodman and Hoden et al 1983). This study was undertaken to evaluate the role of basal serum FSH level as an indicator of ovarian response in infertile women.

## *MATERIALS AND METHODS*

In this prospective study basal (day 2) serum FSH of 120 infertile women attending Manipal Assisted Reproduction Centre (MARC) was determined. These women were recruited for ovarian stimulation with clomphene citrate 50 mg from Day 2 to Day 6 and 75 IU of hMG or pure FSH from Day 7 to Day 10 followed by intra-uterine-insemination of sperms in the same cycle. Monitoring of follicular dynamics and endometrial response was done by transvaginal sonography (TVS). HCG (5000 IU) was given when the leading follicle was more than 18-20 mm. Intra-uterine-insemination of sperms was performed 36 hours after the injection of HCG. Seven women did not turn up for follow up, hence were excluded from the study.

## *OBSERVATION*

Based on basal serum FSH values women were grouped among three categories as follows -

| Category | Basal FSH levels |
|---|---|
| I | < 5 mIU/ml |
| II | 5 - 10 mIU/ml |
| III | > 10 mIU/ml |

Ovarian response in terms of number & size of follicles and endometrial thickness were noted. Further analysis was done based on them.

High basal serum FSH levels were accompanied with poor response in terms of number of follicles. 75% of the women had < 3 follicles in category III while 60% of the women in Category I had more than 3 follicles (Table I).

The percentage of mature follicle leading follicle > 18 mm), was more in category I (82%) and that of immature follicles (follicle < 14 mm) was more in category III (25%), showing that high basal serum FSH is accompanied with poor folliculogenesis (Table II).

Endometrial response was poor in category III (69% with endometrium < 8

**Table I**
**OVARIAN RESPONSE IN TERMS OF NUMBER OF FOLLICLES**

| Category | Ovarian Response | | |
|---|---|---|---|
| | Total women | No. of follicles | |
| | | < 3 | > 3 |
| I | 27 | 11 (40%) | 16 (60%) |
| II | 70 | 44 (62%) | 26 (38%) |
| III | 16 | 12 (75%) | 04 (25%) |

**Table II**
**OVARIAN RESPONSE IN TERMS OF SIZE OF LEADING FOLLICLE**

| Category | Total women | Ovarian Response Size of the leading follicle | | |
|---|---|---|---|---|
| | | < 14 mm | 14-18 mm | > 18mm |
| I | 27 | 5 (18%) | —— | 22 (82%) |
| II | 70 | 13 (18%) | 3 (04%) | 54 (78%) |
| III | 16 | 4 (25%) | 2 (12%) | 10 (63%) |

**Table III**
**ENDOMETRIAL RESPONSE**

| Category | Total women | Endometrial response Endometrium | |
|---|---|---|---|
| | | Poor (< 8 mm) | Good (> 8 mm) |
| I | 27 | 11 (40%) | 16 (60%) |
| II | 70 | 40 (58%) | 30 (42%) |
| III | 16 | 11 (69%) | 05 (31%) |

mm) and when the basal serum FHS was < 5 IU/ml (category I) the endometrial response was better (60% with > 8 mm triple line endometrium) (Table III).

*DISCUSSION*

FSH plays a major role in folliculogenesis by stimulating proliferative process and the synthesis of steroidegenic enzymes and various intragonadal factors. The end of luteal phase is charecterised by a decrease in steroidogenesis which, due to the ovarian pituitary feedback mechanisms, lead to a increase in circulating FSH concentrations. The timely coincidence of this rise of FSH with the initiation of growth of some primordial follicles leads to the rescue of a cohort of primordial follicles from atresia and their recruitment (Goodman and Hoden et al 1983).

Lenton et al (1988) have shown that serum levels of FSH in the early follicular phase begin to rise many years before the menopause. This suggests that the subtle FSH elevations might signal declining ovarian reserve despite regular menses.

Flood et al (1989) and Cameron et al (1988) among others, have reported that such unexpected elevations of FSH are associated with unexplained infertility in the face of regular menses, and may reflect marginal oocyte quality.

Lower E2 and egg production were observed as FSH increased, which is reflected in poor endometrial growth.

In the present study it was noted that when the basal serum FSH was high (category III) both folliculogenesis, in terms of number as well as size of follicle, and endometrial response were poor. Scott et al (1989) have shown that elevated basal FSH is associated with poor IVF performance. Flood et al, (1989) found that women aged 40 or more with low basal FSH did as well as younger women. They also observed that some younger women with otherwise unexplained infertility exhibited elevated basal FSH levels and who did poorly compared to those with normal basal FSH and unexplained infertility.

These observations led to the conclusion that, once a woman displays an elevation of basal FSH, her performance in any induction protocol and in turn the pregnancy rate remain poor.

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