PROGNOSTIC VALUE OF SERUM PROLACTIN LEVEL ON THE INDUCTION OF OVULATION AN ULTRASOUND PROVED STUDY

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SUMMARY

This study was conducted on women attending infertility clinic of Rajhara Mines Hospital, a branch of J.L.N. Hospital. This long term observation on a limited group of ladies aimed to co-relate the ovulation defect in infertile woman, with the serum prolactin level. To determine the basal hormonal level and to detect the midcyclic rise if any, serum prolactin levels were estimated on 1st day, 12th day and 29th day of cycles in every woman. Induction of ovulation was tried in 1st phase with clomiphene citrate and sequential oestrogen and progesterone followed by clomiphene citrate in the 2nd phase. It was noticed that from the point of prognostic value the ladies with low serum prolactin level have very poor response to the trial of induction of ovulation as compared to the ladies with normal or high prolactin values. Thus a tiral has been made to pave the pathway to a very precise and rational therapy for every case of ovulation defect which were still unexplained.

INTRODUCTION

Infertility, a time old, well studied still unexplained phenomenon had been put under serious scientific scrutiny through ages, and causes starting from uterine defect to immunology have been put forward to explain this problem. Today, with the evolvement of new diagnostic tools like Radio Immuno Assay and ultrasound, this perplexing subject is again probed upon in a different way. In this long term study on a limited group of ladies an attempt has been made to

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correlate this phenomenon with the serum level of a particular hormone in the diffferent phase of their menstrual cycle - so that the treatment can be made very precise and rational with improved prognosis.

MATERIALS AND METHODS

This study was conducted on the women attending the infertility clinic of Rajhara Mines Hospital - a branch of Bhilai Steel Plant Hospital. Thirty oligomenorrhoeic women of the infertility, who were already investigated, were taken for this study. In these cases Rubin's test and/or HSG showed no tubal block and hormonal profile done for 3 cycles, with 3 samples in each cycle failed to show LH surge thus confirming the ovulation defect. Special attention was given to serum prolactin level as this hormone showed a constant pattern and indicated a prognostic value after treatment. The serum prolactin levels done with 3 samples on 1st day, 12th day and 20th day of cycle showed more or less constant values in all the samples and the ladies were grouped according to their serum prolactin levels into the following groups :

Group I - Ladies with normal prolactin values.

Group II - Ladies with hyperprolactinaemia.

Group III - Ladies with low prolactin level.

The hormonal assay were mostly done at the Department of Nuclear Medicine, B.S.P. and partly at Patna Medical College.

RIA KITS USED

(1) Serum prolactin : DPC Radioimmuno - assay kit for the direct quantitative determination of serum prolactin.

(2) Serum L.H. : Lutinising hormone Double Antibody RIA Kit.

Ultrasound scans were performed with 3.5 MHz transducer sector scanner and 3 MHz linear phased array.

COLLECTION OF SAMPLES

The serum prolactin levels were done with 3 samples on 1st day, 12th day and 20th day of cycle, to know the basal hormonal level and to detect the midcyclic rise, if any. The serum was separated and stored at - 4^0C.

Induction of Ovulation : was tried in the 1st phase with clomiphene citrate 50mg t.i.d. for 5 days in every cycle for 6 months and ovulation was studied with BBT and cervical mucus test. In the 2nd phase ovulation was tried with injectable sequential estrogen and progesterone for 3 cycles followed by clomiphene citrate 50 mg. t.i.d. for 2 months.

OBSERVATIONS

The ages of the ladies under study were between 25 to 28 years as shows in Table I the marital period varied from 2 to 15 years Table II.

The mean serum prolactin levels of different groups of ladies are tabulated in Table III the scatterogram (Fig. 1) demonstrates the mean serum prolactin level of individual ladies.

Results of induction of ovulation after 1st phase of treatment is shown in Table IV ovulation is positive in 62.5% of ladies in Group - I, 41.6% of ladies

Table I

Age Group of the Ladies

Sr. No.	Age Group	No. of Patients
1	25 - 30	14
2	26 - 35	12
3	36 - 38	4

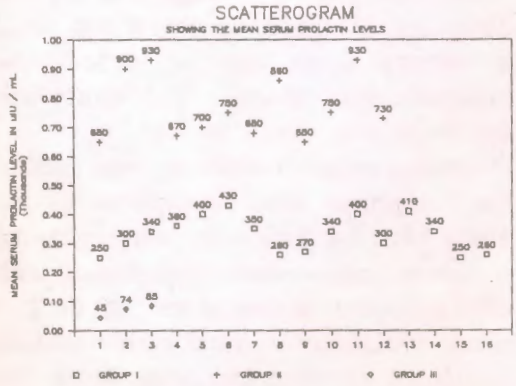

Fig. 1 : Scatterogram showing the mean serum prolactin levels.

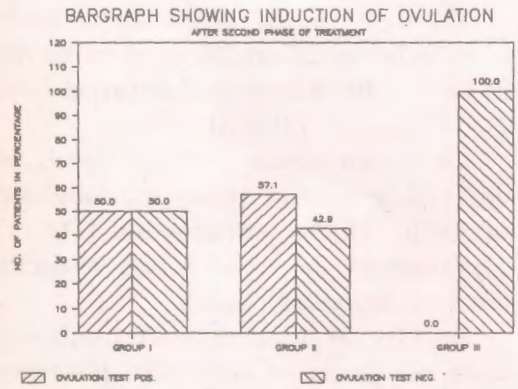

Fig. 2 : Bargraph showing the results of 1st phase of treatment.

Table II

Marital Period of the Ladies

Years	2-5	6-10	11-15
No. of Ladies	12	10	8

Table III

Mean serum prolactin levels

Group	Serum prolactin levels in uIU/ml	No. of Ladies
Group I	200-450	16
Group II	600-950	12
Group III	45-100	3

Normal range 150-500 uIU/ml

in Group II and none in Group III. This is further elaborated in the bar graph (Fig. 2).

Tanle V Fig. 3 show the result of phase - II trial, confirmed by ultrasound. Ovulation is positive in 50% of ladies of Group I, 57.1% in group in Group II but none in Group III.

DISCUSSION

Currently the physiology and pathophysiology of pituitary prolactin in secretion and its impact on fertility were under intense investigation. Prolactin is no longer considered to be the hormone of lactation only, but it is rather considered to be the one of the indices for intact hypothalamic pituitary ovarian axis. With the development of

Table IV

Induction of ovulation after 1st phase of treatment
(Confirmed by BBT and cervical mucus test)

Group	Total No. of patients	Ovulation tests positive	Ovulation tests negative
Group I	16	10 (62.5%)	6
Group II	12	5 (41.6%)	7
Group III	3	None (0%)	3

Table V

Induction of ovulation after 2nd phase of treatment (Proved by Ultrasound)

Group	Total No. of patients	Ovulation seen	Ovulation not seen
Group I	6	3 (50%)	3
Group II	7	4 (57.1%)	3
Group III	3	None (0%)	3

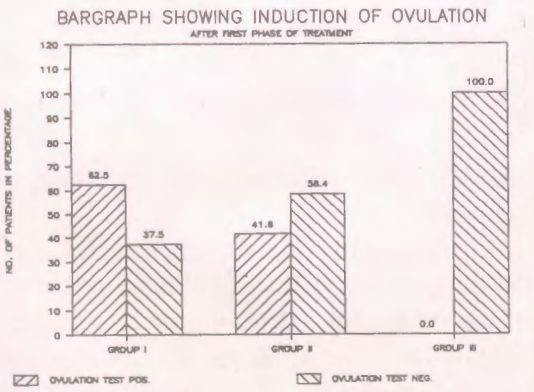

Fig. 3 : Bargraph showing the results of 2nd phase of treatment.

Fig. 4 : U.S. showing mature follicle in right ovary (Group I)

sensitive specific RIA for serum prolactin level and improved resoulution of the real time ultrasound better co-relation between the hormonal levels and ovulation could be brought forward. This has paved the ways for the several modern specific

Fig. 5 :Day 10 scan, follicle of 1-2 cm. in left ovary (Group 3)

Fig. 8 : US. showing follicle of 1.2 cm. in left ovary (Group 3)

Fig. 6 : Day 12 scan 1.6cm size follicle in left ovary (Group 3)

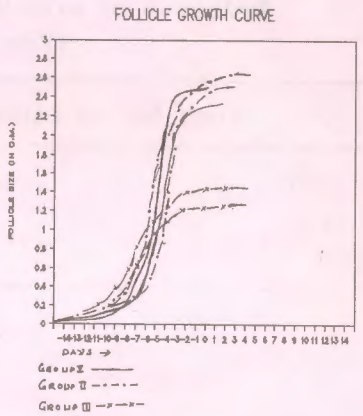

Fig. 9 : The follicle growth curve.

Fig. 7 : Day 15 scan, follicle of 1.6 cm. (Group 3)

modalities of treatment with improvement in prognosis.

In our study the Group I ladies, that is euprolactin ladies, ovulation could be induced by administration of clomiphene citrate in a dose of 50 mg. tid. for a period of 3-6 months. Here ovulation were confirmed by BBT chart and cervical mucus test as RIA study of LH were much expensive and for ultrasound examination patients were to be sent to Main Hospital, Bhilai. Ovulation could be induced in 10 out of 16 ladies (62.5%).

Similarly in Group-III. In phase-II trial ovulation study was made by ultrasound examination from 10th day of cycle till maturation of ovum and ovulation is seen. Ovulation we as seen in 3 ladies (50%) in Group I, 4 in Group II (57.1%) but none in Group III. In phase-II trial ovulation study was made by ultrasound examination from 10th day of cycle till maturation of ovum and ovulation is seen. Ovulation was seen in 3 ladies (50%) in Group-I, 4 in Group-II (57.1%) but none in Group-III, but the peculiar observation with the 3 ladies were that the ovaries were not quiscent, rather in all the three ladies the follicle matured only to a certain extent and then further growth of the follicle ceases. This is shown in the ultrasound scans. Fig. 4 shows the mature follicle of 2.5 cm size in right ovary of one of the Group-I ladies. This was taken just prior to the rupture of the follicle. The Fig 5, 6 & 7 show the serial scan of one of the Group-III ladies. Fig. 4 shows a follicle of 1.2 cm. size in left ovary on 10th day, then 1.6 cm. in 12th day (Fig. 6) and same size on 15th day (Fig. 7). No further growth of the follicle was seen. Similarly in another lady of group-III maximum follcilce size noted from day 12 to day 16 was 1.2 cm. in left ovary; Fig. 7 - the 15th day study.

Finally figure 9 shows the graphic representation of the ultrasound findings of the 3 groups of ladies. Two ladies of each group were included for the study.

Here the day zero represents the 14th day of the menstrual cycle. It was noted that in Group-I the ovum shows mature to full size by day zero. The second group also shows mature ovum on or near day zero, but the group-III ladies show growth of follicle to certain size, here 1.6 cm and 1.2 cm and then further growth of the follicle ceases.

Thus from the point of prognostic value the ladies with low serum prolactin levels have very poor response to clomiphene and cyclic hormonal therapy followed by clomiphene, as compared to the ladies with normal or high prolactin values. The cause of these hyper or hypoprolactinaemia needs still long term study as this involves the complexities of behaviour pattern of hypothalamic pituitary unit. The relation of serum prolactin with ovum maturation and ovulation is still unexplained and needs further elucidation. The central action of prolactin is much thought about, but as described by Bohnet et al (1976) the peripheral action like the prolactin concentration in the follicular fluid requires further attention and much analytic study. Our findings of arrested maturation of ovum at a particular stage points towards the necessity of further augmentation of ovum maturation and rupture by the administration of leutinising hormone at a particular stage of cycle.

CONCLUSION

The challenging problem of infertility and subfertility has perplexed the gynaecologist since decades. Today, in the era of radio-immuno-assay and ultrasound, a further insight is being gained into the unanswered problems of fertility to offer very precise and rational therapy.

REFERENCES

1. *Bohnet H.G., Dahlen H.G. : J. Clin Endocrin. Metab. : 42;132;1976.*