

PLASMA TESTOSTERONE LEVELS IN INFERTILE WOMEN

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SUMMARY

Diagnostic evaluation on 39 infertile women for plasma testosterone was done. Infertile women with secretory endometrium the mean plasma testosterone level was 1.89 nmol/L. In women having anoovulatory cycles it was 2.72 nmol/L. In women having primary amenorrhoea the level was very high, 10.40 nmol/L.

Introduction

It has been difficult to determine with any degree of accuracy the incidence of male or female infertility in the population. The etiological factors involved are so diverse and multiple, that we venture to study the etiological factors as a whole we are unable to acquire an in-depth understanding of the etiological factors involved and succeed only in producing an analytical study comprising only of data. In an attempt to analyse the contributing factors of the infertile state, we conducted the relationship of levels of plasma testosterone in infertile women.

Review of Literature

The first method that was suitable for the determination of plasma testosterone in normal women was described by Finkelstein *et al* (1961).

Ferriman and Purdie (1965) reported

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that amenorrhoea, oligomenorrhoea, irregular menstrual cycles and infertility are frequently associated with hyperandrogenism in women.

Gobelsman *et al* (1974) reported that serum testosterone concentration was highest in the late follicular phase around the time of ovulation.

Valette *et al* (1975) measured plasma testosterone level at the onset, middle and end of the menstrual cycle and observed that no variation of the levels of testosterone in plasma could be related to the time of day or to the phase of menstrual cycle.

Valkov and Dokumov (1977) stated that before wedge resection, patients with Stein-leventhal syndrome had increased plasma testosterone levels than control patients, but after wedge resection, there was no significant difference between control and S.L. syndrome patients.

But on the Contrary, Greenblott *et al* (1976), Pauben *et al* (1977), Steinberger *et al* (1979) reported resumption of ovula-

tory menstrual cycle in hyperandrogenic anovulatory patients after reduction of circulating androgen levels of glucocorticoid treatment or wedge resection of the ovaries.

Backstram and Sodergend (1979) reported the total testosterone level during luteal phase in normal cycle females ranged around 1.89 nmol/L in 36 control subjects.

Material and Method

The diagnostic evaluation was conducted on 38 infertile women who had attended the Queen Mary's Hospital, K.G.'s Medical College, Lucknow, for infertility during May, 1981 to May, 1982. In the present study, we selected 39 female infertile women at random and subjected them to plasma testosterone assay.

According to the presenting symptoms the patients were divided into 3 groups as shown in Table 1

A detailed history was taken in all cases along with a complete physical examination.

TABLE I

Group	Presenting Symptom	No. of patients
I	Menstruating women	27
II	Primary amenorrhoea	6
III	Secondary amenorrhoea	6

A dilatation and curettage/endometrial biopsy was performed in all the patients of group I and II. In cases of group I, the procedure was timed at the premenstrual phase. All the patients in group II underwent a diagnostic laparoscopy. 4 ml. of blood was collected by vene-puncture in all the 3 groups in a heparinised tube. In groups I and II, the blood sample was collected at the time of D & C./E. B. In addition 4 patients in group I had their blood drawn serially for plasma testosterone estimation. On 10th and 21st day of their menstrual cycle. The plasma was separated by centrifuging and then subjected to radioimmunoassay.

Control

Ten fertile patients were studied and

TABLE II

Age	Parity	Duration of marriage in Yrs.	Menstrual History	Endometrial Biopsy	Plasma testosterone level nmol/L
26	Po+o	20	Normal	Secretory	1.76
36	P1+o	12	Normal	Secretory	1.12
30	Po+o	12	Shortcycles	Secretory	0.97
30	Po+o	5	Normal	"	1.56
28	P1+1	18	Normal	"	1.70
21	P1+1	18	Normal	"	4.82
27	Po+2	2	Normal	"	1.99
22	Po+o	7	Scanty	"	1.60
24	Po+o	2	Normal	"	2.02
26	Po+o	8	Scanty	"	1.47
29	Po+o	7	Normal	"	1.82
25	Po+o	6	Normal	"	1.22
24	Po+o	12	Excessive flow	"	2.24
30	Po+o	15	Normal	"	1.53
Mean Level					1.89 normal

their blood was collected in the pre-menstrual phase.

was 2.73 nmol/L as shown in Table III. Thirteen cases were studied.

Results

The mean plasma testosterone level in 10 control patients was 1.8 nmol/L.

The mean testosterone level in cases of primary amenorrhoea was 10.40 nmol/L as shown in Table IV.

The mean testosterone level in infertile women with secretory endometrium was 1.89 nmol/L as shown in Table II. Fourteen cases of both primary and secondary infertility were studied:

The mean testosterone level in cases of Secondary amenorrhoea was 2.31 nmol/L as shown in Table V.

Discussion

The mean testosterone level in infertile women with non-secretory endometrium

was 1.89 nmol/L, while the mean

TABLE III

Age	Parity	Duration of Marriage in Yrs.	Menstrual History	Endometrial Biopsy	Plasma Testosterone nmol/L.
20	Po+o	6	Normal	Non-secretory endometrial	2.50
28	Po+o	10	Scanty	"	2.25
20	Po+o	5	Normal	"	1.15
26	Po+o	4	"	"	1.40
23	Po+o	8	"	"	3.35
22	Po+o	5	Scanty	"	1.43
35	Po+o	15	"	"	7.44
24	Po+o	4	Normal	"	4.12
18	Po+o	3	Scanty	"	1.29x
					2.05xx
24	Po+o	8	Prolonged cycles	"	1.38x
					3.41xx
34	Po+o	12	Normal	"	2.48x
					2.50xx
30	Po+o	15	Normal	"	2.50x
					2.67xx
30	Po+o	15	Normal	"	1.48
			Mean		2.73
(Excluding x specimen of 9, 10, 11, 12)					nmol/L.

x on 10th day of menstrual cycle

x on 21st day of menstrual cycle

TABLE IV

Sl. No.	Age	Parity	Duration of Marriage	Endometrial Biopsy	Testosterone Level nmol/L
1.	22	Po+o	2	Mullarion aplasia	1.97
2.	24	Po+o	4	Mullarion aplasia	6.27
3.	26	Po+o	4	Haematocolpos	4.70
4.	18	Po+o	4	Uterine hypoplasia	3.01
5.	19	Po+o	2	Uterine hypoplasia	36.12
Mean					10.40 nmol/L

TABLE V

Age	Parity	Duration of Marriage in yrs.	Amenorrhoea	Endometrial Biopsy	Plasma Testosterone Level nmol/L
23	Po+o	9	3 yrs.	T.B. endometritis	1.70
38	P1+o	20	7 months	No curettings	1.25
30	P2+o	9	4 yrs.	No curettings	0.96
19	Po+o	2	6 months	No curettings	4.11
30	P3+o	14	5 yrs.	Chronic endometritis	1.78
25	Po+1	50	6 months	T.B. endometritis	4.09
Mean					2.31 nmol/L

level in the women having anovulatory cycles was 2.72 nmol/L which is in accordance with the results of Steinberger *et al* (1979). In some women who had secretory endometrium also has a raised plasma testosterone level which confirms the findings of Ferriman *et al* (1965). Out of 4 patients in whom a serial estimation of plasma testosterone was done on the 10th and 21st day of menstrual cycle, 3 revealed a higher plasma testosterone level in the luteal phase of the cycle and, a lower testosterone level in the follicular phase which is in accordance with the findings of Coyotupa and his associates (1972). The 4th patient on the contrary

revealed a high level in the luteal phase, as reported by Goebelsmann *et al* 1974. As the number of patients in whom a serial estimation was done is only 4, so no conclusion can be drawn.

In women of primary amenorrhoea, the mean plasma testosterone level was very high i.e. 10.40 nmol/L while the mean testosterone level in the Secondary amenorrhoea was 2.31 nmol/L.

Conclusion

Hyperandrogenism is an important cause of anovulatory infertility. Amenorrhoea, specially primary amenorrhoea is

associated with high plasma testosterone levels.

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