EFFECT OF INCREASED TESTOSTERONE LEVEL ON WOMAN’S FERTILITY

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SUMMARY

Preliminary results obtained in women treated for infertility, who were divided into two groups with normal and increased testosterone level as measured in serum on the fourth day of their cycles, are presented. Study population included 50 women, 25 of them with normal and 25 with increased testosterone level. The aim of the study was to investigate the interaction of serum testosterone level with ultrasound finding of septate uterus (indicating minor uterus abnormality), ultrasound diagnosis of the presence or absence of polycystic ovary, hormonal parameters, and spontaneous or stimulated pregnancies. Study results revealed ten (40%) women with normal testosterone to have pathologic levels of FSH, LH and FSH/LH ratio; nine (36%) had polycystic ovary syndrome; and seven (28%) had septate uterus. The results showed increased rate of FSH/LH inversion, polycystic ovary syndrome and septate uterus in the group of women with elevated testosterone. Although performed in quite a small group of subjects, the aim of the study conducted at Nada Polyclinic in Požega, Croatia, was to show the effect of testosterone on some disorders associated with fertility, and to suggest the possible infertility management spontaneously or by insemination at a polyclinic of this type.

INTRODUCTION

Testosterone is usually mentioned in gynecologic literature in connection with the polycystic ovary syndrome (PCOS) (1-5) or a PCOS-like syndrome as one of its indicators. In practice, however, such a disorder is noticed in a number of women in whom an increased level of testosterone has been established, otherwise without any other sign of ovary function disorder.

That is why we decided to test the effect of serum testosterone level on other disorders of the woman’s genital system. Therefore, the aim of the study was to assess the following:

• ultrasound and hormone findings indicating the existence of polycystic ovary, or a disorder of the pituitary gland - ovary axis;
• ultrasound finding of septate uterus (indicating minor uterus abnormality) (6); and
• the beginning of spontaneous and stimulated pregnancies (with particular individual or other tested symptoms).
SUBJECTS AND METHODS

The study included 50 women in whom serum testosterone level was measured on the fourth day of the cycle. According to the results, they were divided into two groups: group A including women with normal serum testosterone level (n=25), and group B with increased serum testosterone level (n=25). The normal and increased testosterone level was determined according to the upper reference testosterone values used at respective laboratories.

The following parameters were observed in both subject groups (7,8):
- increased serum LH level,
- FSH/LH inversion in serum,
- presence of one or more symptoms of polycystic ovary established by ultrasound, and
- anovulation without any signs of polycystic ovary established by ultrasound.

The following signs of PCOS were observed by ultrasound:
- typical configuration of tiny microcystic structures on the ovary periphery,
- enlarged ovary volume,
- presence of an increased amount or density of stroma with characteristic arterial blood flow, and
- tunica albuginea ovarii thickness exceeding normal by 50%.

The rate of septate uterus was observed in both group A and group B (19). The disorder was found on several ultrasound examinations, the septum being wider than 7 mm.

The subjects who had other infertility factors such as severe husband’s oligoasthenospermia, obstructed fallopian tubes, large myomas associated with uterus cavum deviation, uterus abnormalities, and age over 40 were excluded from the study, considering that in our institution only insemination is used (Fig. 1).

RESULTS

In group A consisting of women with normal serum testosterone levels, there was no case of increased serum LH level; FSH/LH inversion was found in 10
(40%) women, whereas the remaining 15 (60%) women had normal FSH and LH level (Fig. 2). Three (12%) women had PCO signs, while anovulation without PCO signs was not found. Septate uterus was found in three (12%) women (Fig. 3). Other infertility factors were recorded in 11 (44%) women who did not undergo infertility treatment. Fourteen (56%) women with normal testosterone level underwent treatment and eight of them (32%) got pregnant (Fig. 4).

Analysis of successful pregnancies in group A women (Fig. 5) reveals that pregnancy failed to occur in subjects with FSH/LH inversion or PCOS. Appropriate therapy resulted in pregnancy in one (4%) woman with PCOS-like syndrome, five (20%) got pregnant spontaneously, and three (12%) conceived with the help of homoinsemination.

In group B including women with elevated serum testosterone levels, FSH/LH findings were not obtained in four (16%) subjects; FSH/LH inversion or increased serum LH level was found in 13 (52%) subjects (Fig. 2); PCOS was found in nine (36%) (Fig. 6), and anovulation in two (8%) subjects. Thus, ultrasound revealed impaired ovary appearance in 11 (44%) women (Fig. 3). Septate uterus was found in seven (28%) women, all with impaired FSH/LH ratio (Fig. 3). Other infertility factors were identified in 15 (60%) women (Fig. 6), and ten (40%) of them underwent treatment for infertility. Five (20%) women got pregnant: three of them (12%) conceived spontaneously (Fig. 7), one (4%) woman conceived by homoinsemination and another one (4%) by IVF procedure at another institution, as the procedure is not performed at this polyclinic.
DISCUSSION

Although the present study could not yield a statistically significant pattern of the parameters observed because of the relatively small number of subjects included, we believe it pointed to a connection between some of the parameters. In the group with increased serum testosterone, there was a significantly higher rate of impaired FSH/LH ratio (Fig. 8), PCOS determined by ultrasound (Fig. 8) and septate uterus (Figs. 8 and 11). The relation of all variables in both groups is illustrated in Figure 8, showing that in group A (subjects with normal serum testosterone level) the existence of polycystic ovaries and septate uterus was confirmed in 12% and impaired FSH/LH ratio in 40% of cases. At the same time, in group B the existence of polycystic ovaries was confirmed in 36%, septate uterus in 28% and impaired FSH/LH ratio in 52% of cases.

The search of MEDLINE index revealed some 230 articles on septate uterus, however, the possible connection of minor and major uterus abnormalities with androgenic metabolism has, to date been only considered by Sorenson in his article published as early as 1978 (6), yet observing no other correlation.

If we now compare the pregnancy frequencies with testosterone level (Fig. 9), it is obvious that there were by far more successful pregnancies in the group with normal testosterone level, which corresponds to the results published elsewhere. The subjects with FSH/LH inversion had the lowest rate of successful pregnancies, only 15% of cases (Fig. 10), which may be
an important indicator in the treatment of infertility. A similar rate of successful pregnancies was achieved in patients with PCO and increased testosterone level, i.e. about 38%. The results are consistent with literature data (1,2).

FSH/LH inversion was also found in 70% of the women with septate uterus (Fig. 11), while the finding of polycystic ovary was recorded in 60% of the same subjects.

**CONCLUSION**

This article shows the results of the analyses performed in 50 women treated for infertility, divided into two groups according to serum testosterone level on the fourth day of their cycles: group A with normal and group B with elevated serum testosterone. Study results showed an increased rate of FSH/LH inversion, PCO syndrome and septate uterus in the group with elevated testosterone level. It is necessary to conduct a detailed research on the connection of septate uterus with the hypothalamus – pituitary gland – ovary axis, indicated by the results presented. The results of infertility treatment at smaller clinics like this one are very successful, along with the fact that such institutions are very accessible to patients.

We would like to point out that in this way, an expensive and more complicated in vitro procedure could be obviated, at least in some patients.

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**REFERENCES**


