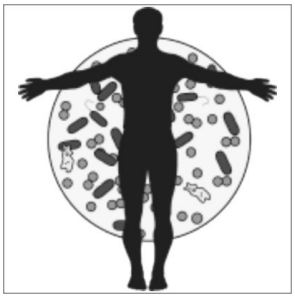
ORIGINAL **Prof-860**
(CLINICAL PRACTICE ARTICLE)

AZOOSPERMIA & OLIGOZOOSPERMIA;
SEMEN AND HORMONAL ANALYSIS OF PATIENTS



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ABSTRACT ... danyal@hotmail.com **Objectives:** To differentiate and analyses different groups of patients according to abnormalities of azoospermia and oligozoospermia. **Design of study:** Prospective study **Setting:** Clinical pathology Laboratory Jinnah Postgraduate Medical Centre Karachi. **Period:** 1999 to2003. **Material & Method:** Analysis of semen volume, liquefaction time, pH and sperm concentration were carried out for 150 men from infertile couples alongwith measurement of hormone levels. 50 normal fathers with proven fertility were taken as control. **Results:** 33.33% patients showed azoospermia (A), 50 cases (33.33%) had oligozoospermia (B), 20 cases (13.33%) were asthenozoospermic (C) and 30 cases (20%) were found to be normozoospermic (D). The hormonal profile showed normal or low levels of testosterone while FSH and LH levels indicated inverse/negative correlation to sperm concentration, whereas no significant relationship between serum prolactin and semen density was detectable between different groups. **Conclusions:** Azoospermic and oligozoospermic subjects are accompanied by a significant rise in FSH levels, and decrease in serum testosterone level. The need for measuring prolactin levels in the evaluation of male infertility is unnecessary.

Keywords: Azoospermia, Oligozoospermia, Asthenozoospermia, LH; FSH; Prolactin; testosterone; Infertile; Male; Pakistan.

INTRODUCTION

Infertility has not received as much emphasis as fertility. Regulation and questions have been raised whether scarce medical resources should be devoted to the prevention, diagnosis or treatment of infertility. In order to determine the fertility potential of the male, seminal and hormonal profiles form the key indices. Reference values with regard to the hormonal profile have been established by several laboratories in the country, yet the primary test of fertility is seminal analysis and so far only one study is reported on the reference value of fertile Pakistani males[1] .

It was Loeuwen Hock who made the observation that a man in whose semen no spermatozoa can be detected is incapable of begetting children. In 1778 Glichen Russwarm, expressed a view to the same effect that "In barren marriages the microscope could settle the dispute between men and women"[2].

Fertility is important in maintenance of marriages. It is a worldwide problem, which has received considerable attention in recent years. In oriental culture and social setup , men hardly agree for fertility evaluation, especially in countries where illiteracy and poverty are more prevalent. About 10-15% couples, globally, have difficulty in initial, as well as subsequent conception, with the major cause being associated with the male partner[3,4].

Male infertility can be assessed through semen analysis and hormonal profile[5]. Absence of spermatozoa in the semen ejaculate is called "azoospermia", count less than 20 million/ml "Oligospermia" and density of 20 million/ml but motility of less than 50% is called "asthenospermia"

Male infertility is associated with a reduction in the quality of sperms. Decrease in sperm density, eventually leading to azoospermia has been found to be associated with raised FSH, LH and normal or low testosterone level[1,6].

MATERIALS & METHODS

Subjects: A total of 150 subjects with 50 controls, were included in the study. Subjects were categorized as normozoospermic, azoospermic, oligozoospermic and asthenozoospermic on the basis of their semen concentration and motility.

Methods

Semen Analysis:

Semen of the subjects were obtained and analyzed according to WHO recommended procedure[7] For each sample, the color, and consistency of semen was visually ascertained and liquefaction time was recorded. Semen volume was measured with a graduated glass pipette. The pH was checked with the help of pH strip . After liquefaction, the semen specimen was thoroughly mixed with the glass rod and thin drop spread on a glass slide by placing a cover slip on it.

Sperm motility was assessed by microscopic appraisal of 100 spermotozoa from different fields. These were classified being actively motile, sluggishly motile and immotile. Total sperm count as million/ml was obtained by diluting 1:19 with formalin diluting fluid or simply with distilled water improved Neubauer heamocytometer.

Inclusion Criteria:

Patients with no relatable cause of male infertility were classified in different groups, based upon their semen picture. The patients were inquired about their abstinence period and were informed that the ideal period is 2 to 7 days. Semen samples were obtained through masturbation and were ejaculated into clean wide mouthed plastic containers, which had already been confirmed to be non-toxic to spermatozoa.

Classification of patients:

The subjects were classified as azoospermic, oligozoospermic, asthenozoospermic and normozoospermic on the basis of their sperm concentration and motility[7,8]. Men who had successfully impregnated their wives without any assisted method during the last six months, and thus exhibited their fertility potential, were placed in the proven fathers group(control). Persons having no spermatozoa in their semen were classified as ozoospermic (A), those having < 20 million/ml were categorized as oligozoospermic (B), while

those having sperm activity less than 50% were categorized as asthenozoospermic(C) and the count ranging between 20-250 million/ml having activity >50% represented the normozoospermic (D) group. A separate group of men, whose spouses were undergoing antenatal assessment at a private medical facility in Karachi were included in the study as proven fathers (E). The final criteria for inclusion of these men in the proven fathers group was the completion of full term pregnancy with a live birth.

Collection of blood samples:
Fresh blood (5 ml) was drawn from the subjects in sterile disposable syringes (Terumu). The blood were transferred to clean test tubes and serum was allowed to retract.

Separation of serum:
After partial retraction of the serum, the tubes were centrifuged at 3,000 rpm in a laboratory centrifuge for 15 minutes. The serum was picked up using disposable Pasteur pipettes and transferred into Eppendrof tubes after proper labeling. The tubes were stored at -20°C until analysis of the serum.

Hormonal Assessment:
The hormonal profile was analyzed using Abbott MEIA technique for peptides and Roche Cobos core system for testosterone.

Statistical Analysis:
Data were analyzed statistically, by application of student's 't' test, as described.

RESULTS

The serum FSH level of subject's in-group C and D were 3.19±0.9 (Range 2.2-11) and 5.5±1.0 (Range 2.1-12.7). Serum LH concentrations (mIU/ml) in azoospermic subjects (Group A) were higher than the values observed in all other groups, that is 12.20±5.4 (Range 0.1±56.6) whereas the mean serum LH values varied between 4.2 to 10.6 mIU/ml in the other groups. There was no marked difference in the concentrations of serum prolactin levels among the different groups (Table I and II).

Table-I. Semen examination of the studied subjects (Mean±SEM)

Group (n)	Condition	Ejaculated volume (ml)	Liquefaction time (min)	pH	Sperm conc. (mil/ml)	Sperm motility (%)		
						Active	Sluggish	Immotile
A (50)	Azoospermic	1.5 ±0.4	37.5 ±0.70	7.8 ±0.1	Nil	Nil	Nil	Nil
B (50)	Oligozoospermic	1.7 ±0.2	28.7 ±3.70	7.3 ±0.1	6.7 ±1.7	15.0 ±6.0	30.0 ±4.5	55.0 ±6.5
C (20)	Asthenozoospermic	2.5 ±0.1	18.5 ±0.07	8.0 ±0.7	35.3 ±8.8	20.1 ±5.1	18.4 ±5.0	16.6 ±8.2
D (30)	Normozoospermic	2.4 ±0.2	18.6 ±3.60	8.0 ±0.8	86.8 ±7.5	66.8 ±2.3	14.5 ±2.1	17.7 ±1.7
E (50)	Control	3.5±0.5	20.5±3.5	8.0±0.5	95.5±10	70.5±4.5	16.5±1.5	13.0±2.0

DISCUSSION

The present data of 150 men who were the male partners of infertile couple, indicate that 66.6% of subjects had low sperm density and were either azoospermic or oligozoospermic whereas in 13.3% of men the sperm motility was low although the sperm concentration was within the normal range (20-120 million/ml). The ratio between the normal and abnormal subjects evaluated on the basis of spermiogram quality was 1:5.9.

FSH, LH and testosterone evaluation is useful in the management of the male infertility[9]. For initiation of spermatogenesis and maturation of spermatozoa, FSH is necessary. In the infertile men, higher concentration of FSH is considered to be a reliable indicator of germinal epithelial damage, and was shown to be associated with azoospermia and severe oligozoospermia[10,11]. In the present study, gonadotrophin (FSH and LH) levels were significantly elevated in infertile males when compared with the levels in proven fertile controls.

Table-II. Hormonal profile of the studied subjects (Mean±SEM)

Groups (n)	Condition	FSH(mIU/ml)	LH(mIU/ml)	Prolactin (mIU/ml)	Testosterone (mIU/ml)
A (50)	Azoospermic	22.9±6.3	12.2±5.4	254±20	8.85±2.2
B (50)	Oligozoospermic	16.6±2.8	10.6±0.8	242±25	8.3±2.7
C (20)	Asthanozoospermic	3.19±0.9	4.2±0.9	239±19	11.05±3.0
D (30)	Normozoospermic	5.5±1.0	5.6±0.5	258±34	22.5±3.5
E (50)	Control	5.8±1.2	5.0±1.0	260±20	24.5±2.5

Present results show that in azoospermic and oligozoospermic men serum FSH levels were significantly elevated, which correlate with pervious studies[3,12,13,14,15]. FSH profile in secretory azoospermic men has been found to be different from that found in men with excretory (obstructive) azoospermia[16]. Out of the 50 azoospermic men in our study, 18 subjects showed normal levels of serum FSH, indicating that they may be representing cases of excretory azsoopermia. Increase in FSH levels, representing secretory azoospermia, may reflect decreased testicular activity resulting in an alteration of the normal feed back mechanism between the testes and the hypothalamic pituitary axis, through an impairment of the Sertoli cells, and decrease in inhibin secretion[13,14,15]. Tubular damage has been shown to be accompanied by a rise in serum FSH[17].

In addition to FSH, LH has also been shown to be inversely correlated with sperm density[16,18]. Lack of relationship between serum prolactin and serum density has been indicated previously[18]. In the present study no significant difference was detectable in the mean prolactin levels between different groups.

On the basis of present data, it is concluded that azoospermic and oligozoospermic subjects are accompanied by a significant rise in FSH levels, and decrease in serum testosterone level. Measurement of FSH in serum may, therefore, be used with advantage in the diagnosis of spermatogenic dysfunction and also to differentiate between secretory and excretory azoospremia[15,16,17].

Increased serum LH and decreased testosterone levels indicate an abnormality in the steroidogenic tissue of the testis and may not necessarily accompany the rise in FSH in men with depressed spermatogenesis. The need for measuring prolactin levels in the evaluation of male infertility, at present appears unnecessary. However, for the evaluation of pituitary tumors, it is quite significant.

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God is the silent partner in all noble enterprises

Anonymous