Oligospermia and its Relation With Hormonal Profile

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Abstract

Serum of 161 oligospermic men was analysed for pituitary hormones LH and FSH and the androgen testosterone. The hormonal analysis indicated normal levels of LH and testosterone, while the FSH levels showed negative correlation to the sperm concentration (JPMA 45:246, 1995).

Introduction

Infertility remains a serious social menace for which semen and hormonal analyses are carried out to establish the cause of male infertility[1]. A low sperm concentration (less than 20 million sperms/nil) is termed as oligospermia[2], which is caused either by hormonal disturbances[3], resulting in impaired spermatogenesis oroccasionally due to obstructive lesions[2]. It is, therefore, important to evaluate hormonal concentrations of Luteinising Hormone (LH), Follicle Stimulating Hormone (FSH) and Testosterone for correlation with the sperm concentrations in cases of mild (10-20 million sperms/mi), moderate (5-10 million sperms/mi) or severe (1-5 million sperms/mi) oligospermia. A study was, therefore, carried out in oligospermic men in whom the hormonal concentrations of LH, FSH and testosterone were quantified and correlated with the oligospermic state.

Patients and Methods

Semen samples were collected from the infertile patients between 20 to 50 years of age and analysed for pH volume, morphology, motility and count as described earlier[2]. Blood was obtained from these patients and serum separated and assayed for LH, FSH and testosterone using Serono Enzyme Immunoassay (EIA) kits. Control samples provided by Sereno were used for quality monitoring of the assay. WHO immunoassay programme version 5.2 was used for calculation of the results, using the 4-parameter logic fitter.

Results

The results are listed in Tables I and II,

Table I. Semen volume and pH of oligospermic patients.

Stage	Age (years)	Volume of ejaculate (ml)	pH of ejaculate
Mild (n=43)	30.30±1.13	3.30±0.16	8.21±0.06
Moderate (n=67)	32.57±0.93	3.31±0.10	8.27±0.05
Severe (n=51)	30.24±0.93	3.33±0.14	8.17±0.05
Control (n=30)	30.93±1.02	2.55±0.16	8.18±0.09

Table II. Hormonal concentrations of oligospermic patients.

Stage	LH mIU/ml	FSH mIU/ml	Testosterone ng/ml
Mild (n=43)	5.09±0.25	36.07±0.82	6.90±0.27
Moderate (n=67)	5.72±0.19	38.31±0.90	6.22±0.27
Severe (n=51)	6.43±0.31	42.53±0.81	6.18±0.38
Control (n=30)	5.76±0.25	5.86±0.47	6.45±0.28
Normal Range	1.1-8.2	1.5-11.5	2.5-10.51

which have been divided into three groups on the basis of severity of the oligospermic state. No significant difference was seen in the pH and volume of semen in any of the oligospermic groups or the controls (Table I). Levels of LH and testosterone were within normal limits in all the three groups

(Table II). FSH levels were raised in all the three groups, exhibiting a negative correlation with the sperm count (Table II) Difference in FSH significant ($p<0.02$), while for moderate to severe and mild to severe, the differences were highly significant ($p<0.001$).

Discussion

In the present study, the hormonal profile of the subjects characterised as oligospermic after their semen analysis showed an elevated level of FSH and normal levels of LH and testosterone (Table II). The mechanism of oligospermia with high levels of FSH and normal LH and testosterone is an abnormal feedback of gonadal peptides and steroids and the defect in the gonadal axis in the oligospermic men does not reside in the hypothalamic pituitary function but rather in the testis[4,5]. Anearlier study carried out in France[6], to investigate the function of the hypothalamic-pituitary-testicular axis for men refering for severe oligospermis, also shows similar findings.
Another study[7] compared the hormonal profiles of normal and oligospermic men. Mild (10-20 million sperms/mi) to severe (1-5 million sperms/mi) oligospermic subjects were included in the study. Mean LH and testosterone levels were normal, irrespective of the sperm count, while FSH levels were inversely correlated to the spermatozoa concentration. A recent study[8] compared serum hormones levels inoligospermic and normozoospennic men and showed an increase in FSH levels, with no significant change in LH and. testosterone levels. Other studies have also reported a significant, but inverse, correlation between FSH levels and sperm concentration[9,10].
It has also been demonstrated that there exists an elevation in FSH levels, with normal LH levels, in oligospermic patients[11]. Similarly, studies have demonstrated no significant difference in LH and testosterone levels between oligospermic and normal individuals[12,13].
The results seem to indicate that normal levels of LH and testosterone are responsible for imparting the secondary sexual characteristics in the infertile patients, while the oligospermic state is the result of the elevated FSH concentration which may be due to sertoli cell dysfunction and germ cell aplasia.

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