

1 Relevance of Sex Hormones Levels With Spermogram of Infertile 2 Men

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7 **Abstract**

8 Infertility is the inability of a sexually active, noncontracepting couple to achieve pregnancy in
9 one year. The causes of male infertility include, the testicular primary failure, deficient
10 gonadotropin secretion or due to unexplained causes. The present study was conducted to
11 verify the relationship of male sex hormones changes with spermogram. To achieve this aim 75
12 infertile men with ages of 30.9 ± 5.8 y and 35 fertile men with ages of 31.5 ± 6.3 y (control
13 group) were enrolled and the prevalence and pattern of endocrinological abnormalities in the
14 patients were investigated for male infertility who attending the Central Public Health
15 Laboratories Department of Hormones and Kamal ALSamaraie hospital period from
16 September 2009 to April 2010.

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18 **Index terms**— Azoospermia, Oligozoospermia, Teratospermia, Asthenozoospermia, FSH, LH, Prolactin,
19 Testosterone, Infertility

20 **1 I. Introduction**

21 he successful and complete male germ cell development is dependent on the balanced endocrine interplay of
22 hypothalamus, pituitary and the testis. Gonadotropin releasing hormone (GnRH) secreted by the hypothalamus
23 elicits the release of gonadotrophins i.e. follicle stimulating hormone (FSH) and luteinizing hormone (LH) from the
24 pituitary gland [1]. FSH binds with receptors in the Sertoli cells and stimulates spermatogenesis. LH stimulates
25 the production of testosterone in Leydig cells, which in turn may act on the Sertoli and peritubular cells of the
26 seminiferous tubules and stimulates spermatogenesis [2].

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29 tgalmohanna@hotmail.com T The failure of pituitary to secrete FSH and LH will result in disruption of testicular
30 function leading to infertility. Testosterone, estradiol and inhibin control the secretion of gonadotrophins through
31 feedback mechanism [3]. Infertility is a common disorder and nearly one out of every six to eight couples suffers
32 couples suffers from it at any given time. Infertility among couples in their respective age is more common than
33 hypertension, diabetes, heart diseases and even the common flu [4].

34 Globally, it has been estimated that approximately 10-15% couples seek medical help for the problem of
35 infertility. In 20-25% cases the problems are attributable to the male partner, while 30-40% represent female
36 factor. In approximately 30% of cases both partners and in 15% no specific factor can be identified [5].

37 Male infertility can be assessed through semen analysis and hormonal profile [6]. Absence of spermatozoa
38 in the semen ejaculate is called "azoospermia", count less than 20 million/ml "Oligospermia", density of 20
39 million/ml but motility of less than 50% is called "asthenospermia", teratospermia is a reduced percentage of
40 sperm with normal morphology assessed by light microscopy [7].

41 Male infertility is associated with a reduction in the quality of sperms. Decrease in sperm density, eventually
42 leading to azoospermia has been found to be associated with raised FSH, LH and low testosterone level [8].
43 Primary hypogonadism results from disorders that affect the gonads directly, and secondary hypogonadism results
44 from defective pituitary gonadotropin secretion.

45 **2 II. Materials and Methods**

46 Subjects : A total of 75 subjects with 35 controls, were included in the study. Subjects were categorized as
47 azoospermia, oligozoospermia, teratospermia and asthenozoospermia on the basis of their semen concentration
48 and motility.

49 Semen analysis : The seminal fluid analysis was done according to the procedure described by the World
50 Health Organization [7].

51 **3 III. Results**

52 To evaluate serum hormonal levels in various subgroups of infertile men, patients were categorized into four groups
53 according to the results of their semen analysis. Group 1 consisted of 19 patients with azoospermia, group 2
54 contained 17 patients with oligospermia, group 3 comprised of 24 patients with asthenospermia, and group 4
55 involved 15 patients with teratospermia. The results of FSH, LH, prolactin, testosterone and free testosterone
56 levels are shown in table ?? and Figure 1-4. Significant ($p<0.01$) decreases were observed for the levels of total
57 and free testosterone, and significant ($p<0.05$) increases were indicated for the levels of FSH and LH in the
58 group of azoospermia and oligospermia when compared with the control group. Patients' of asthenospermia and
59 teratospermia showed insignificant variation when compared with the control group. On the other hand prolactin
60 levels did not show significant variation.

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63 **6 IV. Discussion**

64 FSH, LH and testosterone are prime regulators of germ cell development. The quantitative production of
65 spermatozoa generally requires the presence of FSH, LH and testosterone. FSH acts directly on the seminiferous
66 tubules whereas luteinizing hormone stimulates spermatogenesis indirectly via testosterone. FSH plays a key role
67 in stimulating mitotic and meiotic DNA synthesis in spermatogonia [9].

68 Testosterone is essential for spermatogenesis in all species. There is some debate as to the relative levels
69 required [10]. The androgen receptors are located on Sertoli cells [11] and the peritubular myoid cells and, since
70 they are not expressed on germ cells, the signal must be transduced by these cells, particularly the Sertoli cells.
71 Testosterone deficiency in men is manifested typically by symptoms of hypogonadism, including decreases in
72 erectile function and libido [12].

73 The current results demonstrated elevated levels of FSH and LH with decreased levels of free and total
74 testosterone in the azoospermia and oligospermia patients. However such difference could not be observed in
75 patients with asthenospermia and teratospermia. These result indicated to seminiferous epithelial damage [13].

76 The current finding are in consistence with previous reports. Babu et al had reported elevated levels of FSH
77 and LH levels with low testosterone concentration in infertile men [14]. Sulthan et al had illustrated elevated
78 concentrations of FSH in infertile men due to the seminiferous epithelial destruction [15]. Similar findings had
79 been also reported in other studies [16,17].

80 **7 V. Conclusion**

81 These results suggested that changes of sex hormones in man are related to the alterations of spermogram. Such
82 relationships must be considered in the management of the enrolled patients. The need for measuring prolactin
83 levels in the evaluation of male infertility is unnecessary. ¹



Figure 1: Figure 1 :

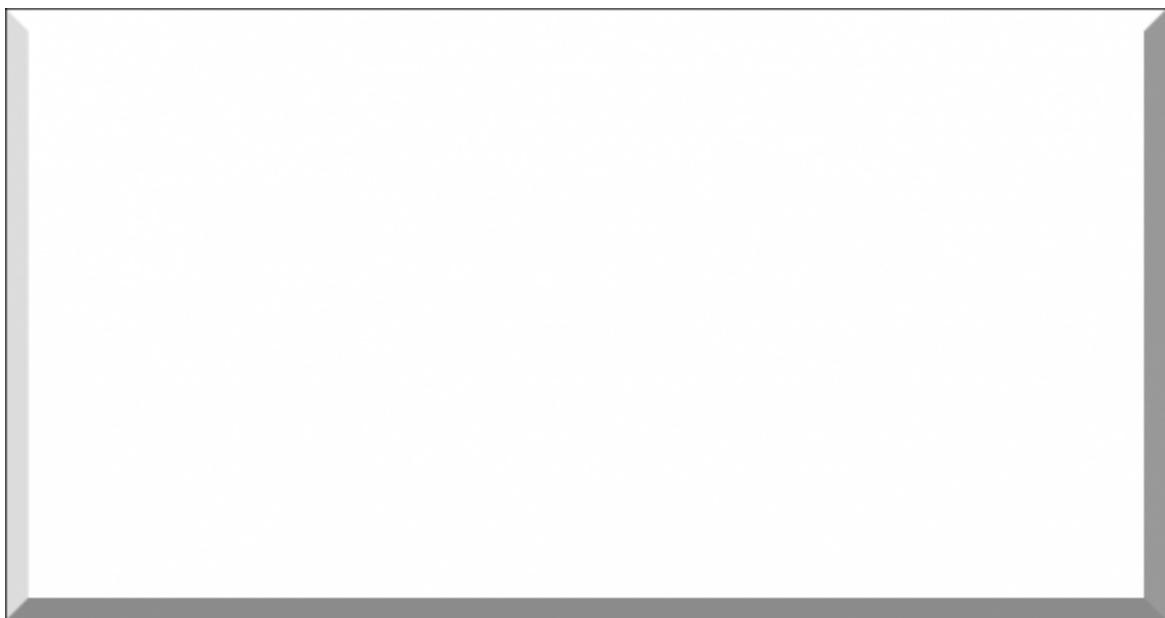


Figure 2:

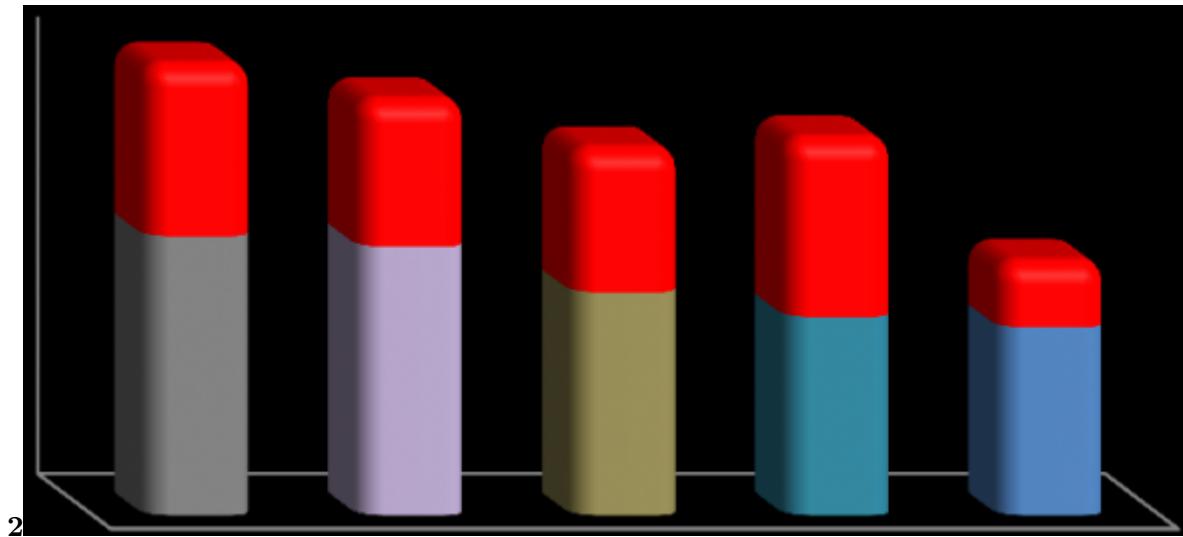


Figure 3: Figure 2 :



Figure 4: Figure 3 :



Figure 5: Figure 4 :

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