

Evaluation of inhibin-B hormone, FSH, and Testosterone in serum of infertile men

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Abstract:

Background: Serum levels of inhibinB hormone, FH and testosterone hormone in serum of infertile men and compare the results with the fertile men (cotrols).

Thirty patients (infertile men) healthy 14 controls included in this study. mean serum inhibinB, testosterone and FH level of oligospermia and azospermia groups were significantly differences than these both control group.

Objective: The study was planned to evaluate serum levels of inhibinB hormone, FSH and testosterone hormone in infertile men and compare the results with these fertile men (Controls).

Materials&Methods: Thirty patients (infertile men) and 14 healthy controls (fertile men) included in this study, Age range (24 to 45 years). The patients (30) were divided into two groups, oligospermia and azospermia.

Results: Mean serum inhibinB, testosterone and FSH levels of oligospermia and azospermia groups were significantly differences than these both control group, while the difference between mean of serum inhibin B, testosterone and FSH of oligospermia and oligospermia group, was not significant except the FSH (P.value=0.039).

Conclusion: The decrease in serum inhibinB and testosterone levels not the increase in the level of FSH hormone in infertile men provide evidence that levels can be used as reliable markers in the diagnostic criteria of male infertility.

Keywords: oligospermia, azospermia, inhibinB, serum.

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Introduction:

Fertility is the ability of the individual to reproduce through normal sexual act. About 90% of healthy, fertile women are able to conceive within one year if they have regular intercourse without contraception (1). Normal fertility requires the production of enough healthy sperm by the male and viable eggs by the female, successful passage of the sperms to the female fallopian tubes, penetration of a healthy egg, and implantation of the fertilized egg in the lining of the uterus. A problem with any of these steps can cause infertility (2)(3). Several hormones play essential roles in spermatogenesis like Inhibin, it is a glycoprotein hormone of gonadal origin, it's secreted by the granulosa (female) and Sertoli (male) cells (4), which has the ability to negatively regulate FSH (5). Follicle-stimulating hormone (FSH) is a member of the glycoprotein hormone family that has a central and essential role in reproduction. (FSH) is a hormone released by the anterior pituitary gland via stimulation from gonadotrophin releasing hormone and potentially

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other factors. It is released in a pulsatile fashion and is regulated in part by glycoproteins, including activin and inhibin. FSH reflects the status of spermatogenesis as a result of the feedback between the testis and hypothalamus/pituitary glands (6) (7).

Materials and Methods:

This study includes (30) infertile men, and 14 fertile men (control) their age range between 24 to 45 years, for the period from December 2013 to April 2014. The patients were chosen from the male infertility clinic of Al-Yarmouk Teaching Hospital and the male infertility clinic of the Institute for Embryo Research and Infertility Treatment, Al-Nahrain University, while fertile subjects were chosen from hospital staff and friends.

Sample collection: Five milliliter of venous blood were collected from each patient and control in a plain tube, the serum was separated immediately after coagulation then stored frozen at -20°C in deep freeze. The deep frozen serum samples were thawed, kept to reach room temperature, and brought for the estimation of inhibinB, testosterone and FSH levels

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Statistical analysis was performed using SPSS version 20. Data were presented through simple frequency distribution table for each variable in the study.

Results:

Table(1) demonstrates the comparison of all the hormones between serum of control(fertile men) group and serum of oligospermia group .Statistical analysis showed that there are significant differences between the two groups

Hormones	Control n=14	Oligospermia n=15	p-value
inhibin-B pg/ml	106.286 ±14.54	18.533 ±3.33	0.000**
Testosterone IU/mL	12.329 ±1.33	8.153 ±1.02	0.018*
(FSH) IU/mL	5.800 ±0.42	9.453 ±0.98	0.002**

Table (1): hormonal assay in serum for fertile and oligospermia

** . is significant at the 0.01 level.

*. is significant at the 0.05 level.

On the other hand, when we discuss the results of azoospermic group as shown in table (2) interestingly all the hormones are statically significant difference without any exception

Hormones	Control n=14	Azoospermia n=15	p-value
inhibin-Bpg/ml	106.286 ±14.54	15.600 ±2.45	0.000**
Testosterone IU/mL	12.329 ±1.33	6.933 ±0.49	0.001**
(FSH) IU/mL	5.800 ±0.42	13.220 ±1.44	0.000**

Table (2): hormonal assay in serum for fertile and azoospermia group

** . is significant at the 0.01 level.

*. is significant at the 0.05 level.

Ns: is non significant deferent.

Now, table (3) focused on the comparison of the hormones in serum for oligospermia and azospermic infertile men .All the studied hormones are statistically not significant except FSH (P<0.01).

Hormones	Oligospermia n=15	Azoospermia n=15	p-value
inhibin-Bpg/ml	18.533 ±3.33	15.600 ±2.45	0.484ns
Testosterone IU/mL	8.153 ±1.02	6.933 ±0.49	0.291ns
(FSH) IU/mL	9.453 ±0.98	13.220 ±1.44	0.039*

Table(3): hormonal assay in serum for oligospermia and azoospermia group.

** . is significant at the 0.01 level.

*. is significant at the 0.05 level.

Ns: is non significant deferent.

Discussion:

In 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(9). FSH is necessary for initiation of spermatogenesis and maturation of spermatozoa (8).Elevated level of serum FSH with increasing severity of seminiferous epithelial destruction which was seen in this study in azoospermic group and to limited extend with oligospermic group ,this noticed by (De-Kretser *et al.*1979), (Babu *et al.*2004),(Sulthan *et al.*1995), (Zabulet *et al.*1994),(10) (11) (12) (13). (Reyes-fuentes *et al.*1997)(14), found that elevated of serum level of FSH hormone was observed in oligospermic males when compared with normozoospermic men.hormones in this study elevation of FSH hormone found in both oligospermic and azoospermic groups.

(Al-Rekabe *et al.* ,2010)(15) found a decrease in the level of testosterone hormone in control men , which agree with our results.(Nieschlag ,1997)(16) found a decrease in FSH level and testosterone in oligospermic men .The data confirm by (Andersson *et al.*2004)(17) that serum inhibin B and FSH levels correlate well with sperm concentration and thus support their role as serum markers of spermatogenesis, these results are in agreement with the study of Andersson *et al* in normal (control) men only ,while ,disagrees with it in oligospermia. In accordance with the study that done by (Brazao *et al.* ,2003)(18) who observed significantly lower serum inhibin B levels and higher FSH levels ,which agree with our results,Brazao *et al* taken group cryptorchid infertile men and this group represent absence of testis , hormones in our present study were did not define the causes of the male infertility and considered the cryptorchid within the infertility.Inhibin B has been evaluated as a serum marker of spermatogenesis in a number of studies(Klingmu" ller and Haidl ,1997), (Pieriket *et al.* ,1998), (Mahmoud *et al.*1998), (von Eckardstein, *et al.* ,1999), (Hipleret *et al.*2001) and (Jensen *et al.*1997).(19)(4)(20)(21)(22)(23) .Present results could be similar to what had been suggested by (Klingmu" ller and Haidl ,1997), (Pieriket *et al.* ,1998), (Mahmoud *et al.*1998), (von Eckardstein, *et al.* ,1999), (Hipleret *et al.*2001) and (Jensen *et al.*1997)(19) (4) (20) (21) (22) (23) ,that explained the inhibin B has been evaluated as a serum marker of spermatogenesis. The observed prediction values of inhibin B and FSH alone or in combination makes it clear that these two markers can never stand alone in the diagnosis of male infertility. Even with a well-defined reference material, a proportion of the infertile men will still fail to be identified if the diagnosis is based on these markers alone (Bohring *et al.* 2002)(24) .This study found that cut-off values of

inhibin B is (15.6pg/ml) in serum azoospermic men ,while in serum oligoospermic men was (18.5pg/ml).

Authoress Contributions:

Shatha Al-Khateeb&Sabah Madi Hussein supervised the research.

Ahmad A. A. IbrahimDahy designed, performed the experiments, and write the manuscript.

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