Assessment of Hormonal Essay in Non-Obstructive and Obstructive Subject in Central India

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Abstract

Infertility is slowly become major issue for married fertile couple in India. Now a days due to availability of many techniques and tests we came to know that male partner is equally contributed for infertility. The term "Azoospermia" is defined as the complete absence of sperm in the ejaculate, is identified in approximately 1% of all men and in 10 to 15% of infertile males. The various causes of infertility include disturbances in both partners (26%),disturbances in female partner (39%) and disturbances in the male (20%). No identifiable cause was found in 15% of cases. Around 1.5% azoospermic infertile male attributed to obstruction of the excurrent genital tract. In this study we focus on some etiological facts of azoospermia that plays important role in causing male infertility. We found that the level of hormones FSH and LH are significantly raised as compare to control group. Also, the testosterone level is significantly less in azoospermic subject as compare to control group. When we separately compared the hormonal profile of Obstructive and non-Obstructive subjects we found the level of Gonadotropic hormone FSH and LH is significantly high in Non-obstructive Azoospermic patients while the testosterone hormone level is significantly low in Non-obstructive Azoospermic subjects. It indicates the primary hypogonadism. This study depicts the hormonal profile in infertile male that will be helpful in further assessment and management of such individuals.

Keyword: *Infertility, Obstructive and non- Obstructive azoospermia,Gonadotropic hormone FSH and LH, Spermatogenesis.*

Introduction

In every species the progeny carries the gene that is must for continuation of species. In India since so many decade one more new issue is arises which is related to big issue in society that is male infertility.

According to World Health Organization, **"**Infertility is the inability of a sexually active non contracepting couple to achieve pregnancy in one year". Infertility is a common condition with important psychological, economic, demographic and medical implications. Demand for infertility services has grown substantially even though the prevalence of infertility has been stable.

The term "Azoospermia" is defined as the complete absence of sperm in the ejaculate, is identified in approximately 1% of all men and in 10 to 15% of infertile males.[1] This diagnosis must be confirmed by centrifugation of a semen specimen for 15 min at room temperature with high-powered microscopic examination of the pellet and a centrifugation speed of at least 3,000 rotation per minute. The semen analysis should be performed according to the 2010 WHO guidelines, and at least two semen samples obtained more than two weeks apart should be examined.[2,3]

The various causes of infertility include disturbances in both partners (26%), disturbances in female partner

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(39%) and disturbances in the male (20%). No identifiable cause was found in 15% of cases. Around 1.5% azoospermic infertile male attributed to obstruction of the excurrent genital tract.[4]

Azoospermia may be due to variety of condition and complete history, physical examination, hormonal profile, genetic and imaging resources will be necessary not only to establish the cause but also to direct the couple towards the best treatment option suitable. The evaluation of a patient with azoospermia is performed to determine the etiology of the patient's condition.

Hormones evaluation is essential parameters in giving a definitive diagnosis in infertile males.[5] Abnormal hormone production has been noted as a male causative factor in male infertility and hormonal replacement could play a corrective role.[6,7] The most essential hormones to be evaluated include, follicle-stimulating hormone (FSH), luteinizing hormone (LH) and testosterone.[8] Merino, G et.al., suggested that decrease in sperm count is associated with low testosterone level.[9] Changes in FSH and LH levels could result in abnormalities of spermatogenesis in patients with low sperm counts.[10]

Spermatogenesis is regulated by luteinizing hormone (LH) produced by the pituitary gland. LH binds to receptors on Leydig's cells and stimulates testosterone production, which in turn binds to sertoli cells to promote spermatogenesis. Follicle stimulating hormone (FSH) is also essential because its binding to sertoli cells stimulates testicular fluid production and synthesis of intracellular androgen receptor proteins.[10] Testosterone regulates its own secretion by negative feedback mechanism. It acts on hypothalamus and inhibits the secretion of luteinizing hormone-releasing hormone (LHRH). When LHRH secretion is inhibited, LH is not released from anterior pituitary, resulting in the stoppage of testosterone secretion from testes. On the other hand, when testosterone production is low, lack of inhibition of hypothalamus leads to secretion of testosterone through LHRH and LH.

Some causes of Azoospermia are potentially correctable, other conditions are irreversible but still possibly treatable by assisted reproductive techniques using the husband's semen and finally some causes are irreversible and not amenable to any form of treatment demanding donor semen or adoption in order to constitute a family.

With the above background the present study was conducted to find out the association between Azoospermia and Gonadotropin levels.

Material and Method

The current cross sectional study was conducted in department of physiology, rural based Medical College during study period from September 2011 to August 2013. The total numbers of subjects studied were 100 in reproductive age group (21 to 45 year). The semen samples were obtained from male partner of infertile couples attending the reproductive biology unit of department of physiology. They were referred from gynecology department. Samples were analyzed as per WHO guidelines (**WHO laboratory Manual, 2010**).[2]We obtained an informed written consent from all study participants. The use of confidential patient data in this study was fully within the recent guidelines. During the above mentioned period 603 patients visited the reproductive biology unit, out of which 120 patients were diagnosed as Azoospermic. Out of 120 azoospermic patients 30 were follow up cases. They were excluded and 90 freshly diagnosed patients were selected for study.The patients were interviewed about their case histories, their reproductive problems, and their family background.

Inclusion criteria:-Subjects belonged to active reproductive age group and which demonstrated azoospermia in semen analysis.

Exclusion Criteria: Unmarried male attended reproductive unit for complaints other than infertility & vasectomized subject.

The semen samples were collected after a sexual abstinence of 3 to 5 days (**Preidt. R., 2003**).[11] The most preferred method for collection of sample was Masturbation (Self-Stimulation), another method was Coitus interruptus (withdrawal of penis just prior to ejaculation during sexual intercourse). The semen specimen was collected in a small, clean wide mouthed jar of 10 to 20 ml. In subject with absence of spermatozoa in semen three consecutive semen analyses were performed at an interval of one month each. Finding of absence of spermatozoa was confirmed by centrifuging the sample at 3000 rpm for 15 min and examining the sample under compound microscope.

Macro & microscopic examination of Semen sample were performed. Patient had been explained regarding the procedure. After proper exposure of genital region,

examination was performed with the patient in standing and supine position. A complete generalized & local examination had been done.

Subject was send to clinical biochemistry laboratory for hormonal profile (FSH, LH & free testosterone) and the data was collected. All the data was abstracted on a standardized data collection form. We used a spreadsheet to enter the data electronically and used statistical software SPSS.

Observation and Results

Table 1: Distribution of study subjects

Study Subjects	No. of patient	Percentage (%)
Type of Azoospermia		
Obstructive Azoospermia	36	40
Non-Obstructive Azoospermia	54	60
Total	**90**	**100**

*Control group = 50

In this study, 90 Azoospermic patients were classified on the basis of Pathophysiology diagnosed in Sonological findings as Obstructive and Non-Obstructive Azoospermic patient.

We found 36 cases had obstruction and were classified into Obstructive Azoospermia while in 54 cases obstruction was not seen and were classified into Non- Obstructive Azoospermia.

We observed that out of 90 azoospermic patients, 40 % of patient was of Obstructive Azoospermia and remaining 60 % was of Non- Obstructive Azoospermia. **[Table 1].**

Table 2: Comparison of Hormonal profile among study groups

Hormonal profile	Control (n=10)	Azoospermic (n=90)	z-value	p-value
FSH ((mIU/ml)	17.87±1.76	24.03±9.09	2.12	0.036, S, p<0.05
LH (mIU/ml)	8.07±1.29	12.68±8.54	1.69	0.093, NS, p>0.05
Testosterone (pg/ml)	31.41±3.84	23.23±33.42	0.76	0.444, NS, p>0.05

The Mean FSH levels in Azoospermic were significantly High (24.03±9.09) as compared to that of control (17.87±1.76) with p<0.05. The comparison of the Mean LH levels and free Testosterone in between Azoospermic and Control were found to be insignificant (p>0.05). **[Table 2].**

Table 3: Comparative hormonal profile among different subgroup of Azoospermia

Sub Group	FSH (mIU/ml) (Mean ± SD)	LH(mIU/ml) (Mean ± SD)	Free Testosterone (pg/ml) (Mean ± SD)
Obstructive Azoospermia (n=36)	18.37±4	8.04±2.28	36.54±48.95
Nonobstructive Azoospermia (n=54)	28.36±9.57	16.26±9.80	13.35±8.91
z-value	6.66	5.76	2.8
p-value	0.000, S, p<0.05	0.000, S, p<0.05	0.000, S,p<0.05

By comparing Hormonal levels in Obstructive and Non-obstructive Azoospermic patients, We found that Mean FSH level in Non-obstructive azoospermia was significantly high (28.36±9.57) as compare to in Obstructive Azoospermia(18.37±4) with $p<0.05$. Also, the Mean LH level in Non-obstructive azoospermic subjects was significantly high (16.26±9.80) as compare to in Obstructive Azoospermic subjects (8.04±2.28) with $p<0.05$. The Mean Free Testosterone level in Obstructive Azoospermic subjects was significantly high (36.54±48.95) as compared to in Non-Obstructive Azoospermic subjects (13.35±8.91) with $p<0.05$. **[Table.3]**

Discussion

Most of the time in developing countries like India females is blamed for infertility issue though the fact is that male partner is equally contributed regarding infertility.

In this study we focus on some etiological facts of azoospermia that plays important role in causing male infertility. We found that the level of hormones FSH and LH are significantly raised as compare to control group. Also, the testosterone level is significantly less in azoospermic subject as compare to control group.

When we separately compared the hormonal profile of Obstructive and non- Obstructive subjects we foundthe level of Gonadotropic hormone FSH and LH is significantly high in Non-obstructive Azoospermic patients while the testosterone hormone level is significantly low in Non-obstructive Azoospermic subjects. It indicates the primary hypogonadism.

Conclusion

This study depicts the hormonal profile in infertile male that will be helpful in further assessment and management of such individuals.

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