



SEMEN PARAMETERS;

TO STUDY THE SEMEN PARAMETERS AND HORMONAL STATUS IN NORMOSPERMIC, OLIGOSPERMIC AND AZOOSPERMIC MEN AT JINNAH HOSPITAL FERTILITY CENTRE, LAHORE

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Article received on:
07/12/2017

Accepted for publication:
10/04/2018

Received after proof reading:
00/00/2018

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ABSTRACT... Objective: The objective of this study was to study the semen parameters and its relation to hormonal status in infertile men. **Study Design:** Cross sectional study. **Period:** March 2015 to April 2017. **Setting:** Jinnah Hospital Fertility Centre; Department of Obstetrics and Gynecology, Lahore. **Method:** A total of 70 infertile men were included in this study. Semen samples for semen analysis and serum for hormonal analysis were obtained and further tests were performed. **Results:** The results of our study show that 28.57% were Normospermic, 18.56% were azoospermic and 52.85% were Oligospermic. In Oligospermic and azoospermic patients significant low levels of testosterone and prolactin were noticed. The results indicate that along with semen parameters hormonal levels should also be assessed to diagnose the underlying cause of infertility. **Conclusion:** It is concluded from our study that both quality of semen and hormonal levels cause infertility in men. Therefore the patients should be properly investigated and should be treated accordingly to the underlying abnormality. This is a regional study and further studies should be conducted to have a conclusive evidence at national level.

Key words: Primary or secondary infertility, azoospermia

Article Citation: Sultan J, Khan SH, Ahmed M. Semen parameters; to study the semen parameters and hormonal status in normospermic, oligospermic and azoospermic men at Jinnah Hospital Fertility Centre, Lahore. Professional Med J 2018; 25(7):1024-1028. DOI:10.29309/TPMJ/18.4478

INTRODUCTION

Infertility can be due to male and female causes. Different factors are responsible for infertility in men and women. Infertility can be defined as a physically healthy couple is unable to conceive even after one year of unprotected sexual intercourse. Infertility occurs in every part of the world but differs in different countries. Infertility is a problem that is related to gynecology and it's of types one is primary infertility and second is secondary infertility. If a couple is trying for pregnancy for the first time it is called primary that affects about 15% of the population. If infertility affects later in life before menopause it is called secondary infertility. It roughly affects about 10% of the population. Sub Saharan African countries are affected with secondary infertility up to 52% while in Asian countries it could be as low as 23 %.¹

The understanding about infertility in different regions of the world is different. It varies from

culture to culture as well as among different religions. In many regions of the world especially African countries and some Asian countries including Pakistan it is considered as social stigma.² The situation is awry for the couple and puts trivial psychological, cultural and societal burden.³

A lot of factors including human and environmental play the role in causing infertility in men and women. Both male and female causative factors are associated with infertility. Among male causative factors low sperm count or sub-optimal quality of semen are the two main factors. About half (50%) of all cases associated with infertility are the result of male factors. Only 20% of the cases result due to both male and female factors combined.⁴ A study conducted in Nigeria shows that 30% of all infertility cases are contributed by both male and female factors while 28.6% of cases are the result of sole male factor.⁵

The detailed analysis and hormonal level investigation are two important criteria to label a man as infertile.⁶ Different characteristics of sperms such as volume of ejaculation, pH, sperm motility, normal morphology and concentration of the sperms are important. Two other important terms used are azoospermia which is absence of sperms in the ejaculate and oligospermia that refers to sperm count fewer than 20million per milli liter.

Hormones that are vital for fertility are one of the prime factor of male infertility and their abnormal level affects fertility.⁷ If this condition is reversed by treatment the fertility can be restored.⁸ The hormones that are vital for reproduction include follicle stimulating hormone (FSH), luteinizing hormone (LH), prolactin (PL) and testosterone hormone. Other two hormones which play their role but are of much less importance include thyroid and estradiol hormone.⁹ Suboptimal level of testosterone is associated with decreased number of sperms.¹⁰

Different types of spermatogenesis abnormalities can be the result of changes in follicle stimulating hormone and luteinizing hormone.¹¹ Galactorrhea, hypogonadism, inability to impregnate and infertility can be due to high prolactin levels.¹²

The part of the brain that controls production of gametes, changes as a result of secondary sexual development and secondary sexual features is hypothalamus. It also controls the copulatory moments of both genders. Certain number of neurons in hypothalamus are believed to be sensitive to testosterone and estrogen levels.¹³

The yield of sperms is controlled by luteinizing hormone that is formed in pituitary gland. Its mechanism of action is that it acts on leydig cells to produce testosterone which binds to sertoli cells and stimulates production of sperms. Another important hormone is FSH which also binds to Sertoli cells and produces testicular fluid and a protein called androgen receptor protein.¹⁴ Testosterone also regulates its own production through negative feedback mechanism. When testosterone is high its feedback mechanism

shuts down its production and is low situations it turns the production in on mode. This is one of the important mechanisms of its production.

This study is focused on the different semen parameters and related hormonal status that contribute to infertility in otherwise healthy men.

MATERIALS AND METHODS

This study was conducted at Jinnah Hospital Fertility Centre, Department of Obstetrics and Gynecology, Lahore, from March 2015 to April 2017. A total of 300 patients were investigated within this period. However in this study 57 subjects were included on the basis of analysis of both hormonal and semen analysis as part of their infertility investigation. WHO criteria was followed for semen analysis.¹⁵ The volume of each sample was measured by using graduated pipette. Color, viscosity and time of liquefaction was recorded. Sperm concentration was counted using sperm analysis chamber in million per milli liter. Binocular compound microscope was used to observe sperms under high power lens. The morphological structure and motility of sperms was observed.

Hormone analysis of FSH, LH, testosterone and prolactin was done using ELISA kit and microplate reader.

Inclusion Criteria

Only normal healthy married individuals were included in this study. They were not having any underlying chronic disease. All were married at least since past one year.

Exclusion Criteria

The individuals with any chronic or underlying disease were not included in this study. All individuals who were married for less than one year were excluded from the study.

Sampling and Examination of Samples

All subjects were well informed and educated how to take the samples. All samples were taken in Jinnah hospital Lahore. Fresh samples were processed to their physical, sperm count and hormonal analysis.

STATISTICAL ANALYSIS

All samples were assessed for sperm count according to WHO criteria for normospermia, oligospermia and azospermia. All values were carefully recorded. Statistical analysis was done using student's t-test.¹⁶ The results were shown as tables and graphs. P value was kept less than 0.05.

RESULTS

During this period of time about 435 individuals were investigated for their primary or secondary infertility. Out of these 435 men 70 patients were selected for this study according to our inclusion and exclusion criteria. The samples of these patients were subjected to hormonal and sperm analysis. Among the individuals analyzed 20 (28.57%) were azospermic, 13 (18.5%)

were normospermic and 37(52.85%) were oligospermic. The results are presented in the following Table-I.

In our study 52.85% patients were Oligospermic, 18.56% were azospermic and 28.57% showed up as Normospermic.

Semen analysis for sperm count and their motility was done and their results are presented in the following Table-II.

The hormonal levels of LH, FSH, prolactin and testosterone were also studied and their results are given in the following Table-III.

The number of normal and abnormal status of different hormone can be presented as Table-IV.

Description	Result	Percentage %
Oligospermic	37	52.85 %
Azoospermic	13	18.56%
Normospermic	20	28.57%

Table-I. Showing the number and percentages of different categories of subjects

Description	Number(n)	Sperm Count x 10 ⁶	Sperm Motility x 10 ⁴
Oligospermic	37	9.30±3.01	4.34±1.93
Azoospermic	13	00	00
Normospermic	20	45.21± 6.68	30.42±3.41

Table-II. Showing sperm count and motility in different groups

Description	Number(n)	FSH	LH	Testosterone	Prolactin
Oligospermic	37	13.36±4.16	11.93±4.16	9.83±2.61	14.72±2.93
Azoospermic	13	15.15±4.9	22.34±1.27	7.43±2.17	15.93±2.51
Normospermic	20	3.03±0.94	8.32±2.89	6.83±2.21	15.73±3.02

Table-III

Hormone	Normal Number	Percentage of Normal	Abnormal Number	Percentage of Abnormal Number
FSH	59	83.09%	11	15.71%
LH	43	61.42%	27	38.57%
Testosterone	24	34.8%	46	64.78%
Prolactin	28	40.00%	42	60.00%

Table-IV

The results of our study show that 83.09% of individuals with infertility had FSH in normal ranges. LH hormone were abnormal in 61.42%, similarly prolactin showed abnormality in 60% while testosterone in 64.78% of infertile men. These results are illustrated in above tables.

DISCUSSION

The results of our study are quite significant and are comparable to other studies conducted in different countries. No such data was available in our country. Another study shows that 58.8% of severe azospermia and oligospermia in

infertile individuals having abnormal hormonal level and 40.9 % of infertile men who had normal hormonal level were diagnosed as azoospermic and Oligospermic.¹⁷

If we compare the endocrinological results of our study it shows that these are higher than a study conducted in Kenya the value were 53.1% for prolactin and 43.7% for testosterone.¹⁸

The normal hormone pattern seen in some of the patients may be related to either obstructive azoospermia or retrograde ejaculation and further evaluation in form of vasography, testicular biopsy and post-coital urine wash may be needed.

Infertility in men problem of serious social concern. It has a wide range of etiology and needs to be properly investigated and diagnosed.¹⁸ This study throws a light on the importance of proper investigation of underlying causes of infertility because most of the cases can be easily corrected.

There are different cause of azoospermia that can be fail to produce sperms or obstruction of ducts on both sides.¹⁹ In our study most of the patients that were more than forty years old were azoospermic. Probably this is due to the cause that semen quality deteriorates 3% each year.²⁰

CONCLUSION

It is concluded from our study that both quality of semen and hormonal levels cause infertility in men. Therefore the patients should be properly investigated and should be treated accordingly to the underlying abnormality. This is a regional study and further studies should be conducted to have a conclusive evidence at national level.

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

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*The smallest deed is better than
the greatest intention.*

– John Burroughs –

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