

Contribution of Male Factor in Infertility in a sample of local population of Pakistan

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ABSTRACT

Aim: To find out contribution of male factor responsible for infertility among infertile Pakistani couples and to detect the abnormalities of seminal parameters among infertile male subjects.

Methods: This cross sectional study was conducted at Physiology Department, University of Health Sciences, Lahore. Two hundred infertile males fulfilling the inclusion criteria and visited the infertility clinics of Combined Military Hospital and General Hospital, Lahore were chosen for the research. Thorough history was taken relevant physical examination, scrotal ultrasound and semen analysis of all subjects were performed.

Results: Among males, the infertility factor was identified in 30.5% on the basis of semen analysis, while 53% suffered from unexplained infertility. Two groups emerged by Semen analysis of 200 men from infertile couples, first group comprised of men (101) with normal semen parameters and men (99) with abnormal semen parameters. The semen analysis of these 99 infertile males revealed that Asthenozoospermia (31.3%) is the most common abnormality of semen parameters followed by Oligospermia (23.2%), Tertozoospermia (20.2%) and Azoospermia (19.2%). There was non-significant difference found in the testicular volume, seminal volume, pH and viscosity among different groups emerged after semen analysis.

Conclusion: The frequency of male factor infertility is quiet high among infertile couples, equally high is the frequency of unexplained infertility. It is high time to educate our males for undergoing semen analysis and other relevant thorough investigations to find out the cause of infertility to be successful in treating infertility.

Keywords: Male factor infertility, Asthenozoospermia, Oligospermia, Azoospermia, Seminal volume.

INTRODUCTION

Infertility is a major cause of lack of harmony in marital life, although the reproductive process requires the interaction and integrity of the female and male reproductive tracts yet any factor that affects any of the two can cause infertility¹. Unfortunately, as the lady nurtures the pregnancy so conventionally she remains the focus of investigations and bears the brunt of infertility, specifically in the developing countries². Therefore the causes of male factor infertility generally remain under-diagnosed and under-treated². According to WHO currently 60–80 million couples (8-12%) globally suffer from infertility³. According to literature 40% of infertility cases are due to men⁴, 30% to women and 20% to both sexes³ and 10% remain unexplained.

The single most valuable and essential investigation that is considered gold standard for detecting male factor infertility is Semen analysis. Its sensitivity for detecting this type of infertility is 89.6% moreover; it can diagnose 9 out of 10 men with abnormal semen parameters⁵.

Males with sperm parameters below the values given in WHO manual for Standardized Investigation and Diagnosis of Infertile Male are labelled with male factor infertility⁵. These abnormal semen parameters are low sperm concentration (oligozoospermia), poor sperm motility (asthenozoospermia), abnormal sperm morphology (teratozoospermia) and absence of sperms (Azoospermia)⁵. Different countries have done research to find out the prevalence of male factor infertility but there is lack of such research in our country.

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Keeping in view the aforementioned facts the current study aimed at finding the frequency of male factor infertility based on deranged semen parameters.

MATERIAL AND METHODS

It is a descriptive cross sectional study. Among the patient reporting at Combined Military Hospital, Lahore and Lahore General Hospital a total of 200 male subjects were chosen for the research project. The laboratory work was done at the Department of Physiology, University of Health Sciences, Lahore. Exclusion criteria included history of infertility for less than 1 year, trauma to genitourinary system and abdominal surgery with due to malignancy and other chronic diseases. Semen samples were obtained from all subjects. Semen samples were collected after 3 days abstinence from sexual intercourse. Thorough history was taken and physical examination was performed. Semen Samples were taken in sterile containers. Semen analysis was performed within one hour of sample collection. Scrotal Ultrasound was performed on the subjects.

Values of various parameters are presented as mean and SD. One Way ANOVA paired test was used for statistical evaluation, $p < 0.05$ was considered statistically significant.

RESULTS

In present study the age of the subjects ranged from 22 to 38 years with a mean \pm SD age of 31.6 ± 3.32 years. Among males, the infertility factor was identified in 61 (30.5%), while in females it was present in 48(24%). Infertility factor in both males and females was identified in 38(19%). Unexplained infertility was present in 53(26.5%) male subjects.

Table 1: Frequency & Percentage distribution of infertility factor

Presence of Infertility Factor	Frequency	%age
Male alone	61	30.5
Female alone	48	24.0
Both (husband and wife)	38	19.0
Unexplained couples	53	26.5
Total	200	100

Testicular volume (ml) recorded through ultrasonography in different groups of semen analysis, showed no statistical difference among different semen groups ($p > 0.05$) (Table 2). No significant difference in the testicular volume, semen volume and pH was observed among different Semen groups (Table 2).

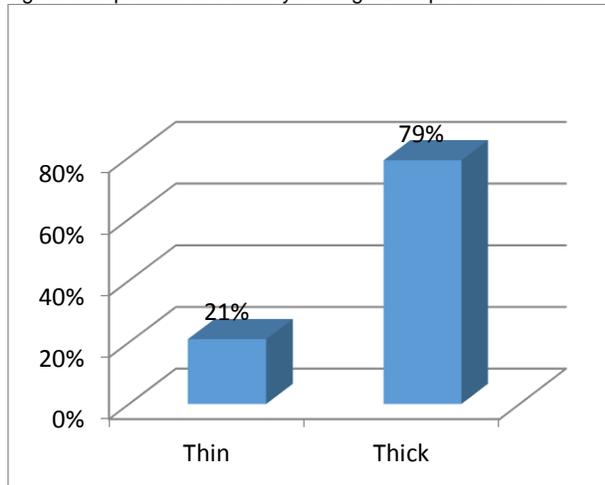
Table 2: Comparison of testicular volume, Seminal Volume and pH with Categories of semen analysis

Seminal Categories	Asthenozoospermia (n=31)	Azoospermia (n=19)	OAT (n=6)	Oligozoospermia (n=23)	Teratozoospermia (n=20)	NA (n=101)	p- Value by ANOVA
Testicular volume(ml)	21.6 ± 1.8	21.6 ± 1.5	21.7 ± 2.3	21.7 ± 2.0	21.9 ± 2.1	21.3±1.8	P > 0.05
Seminal Volume(m)	2.61 ± 0.2	2.15±0.35	2.53 ± 0.14	2.61 ± 0.20	2.49 ± 0.22	2.55±0.22	P > 0.05
Seminal pH	7.41 ± 0.17	7.32±0.14	7.37 ± 0.18	7.39 ± 0.16	7.37 ± 0.19	7.41±0.17	P > 0.05

Not applicable (NA) group comprises of the sub groups having female factor infertility and unexplained infertility.

The viscosity of semen was tested on gross vision procedure and compared in different groups of semen analysis. Only 4 specimens of the azoospermia group (4%) out of 21 showed any positive result for being thin, while semen was thick in rest of 15 azoospermia and the other three groups (95.9%) (Fig 1).

Fig. 1: Comparison of viscosity among Azoospermic Men



Two groups emerged by Semen analysis of 200 men from infertile couples i.e., first group comprised of men (101) with normal semen parameters and men (99) with abnormal semen parameters (Table 4). Out of 101 men with normal parameters 48 men were husbands of the females who were responsible for infertility while 53 men fall under the category of unexplained infertility. The semen analysis of 99 infertile males with abnormal semen parameters was classified as Asthenozoospermia 31(31.3%), Azoospermia 19(19.2%), Oligozoospermia (OAT) 6(6.1%), Oligozoospermia 23(23.2%) and Teratozoospermia 20(20.2%) (Table 5).

Table 4: Categories of Infertile Men according to Semen Analysis

Categories of infertile men	Frequency	%age
Men with Normal Semen parameters	101	50.5
Men with Abnormal Semen Parameters	99	49.5

Table 5: Frequency & percentage distribution of abnormal semen parameters

Abnormal Semen Parameters	Frequency	%age
Asthenozoospermia	31	31.3
Azoospermia	19	19.1
Oligozoospermia	23	23.2
Teratozoospermia	20	20.2
Oligoasthenozoospermia	6	6

DISCUSSION

Literature shows that males is equally responsible for infertility. Semen analysis provides useful information about the abnormalities of semen that can cause male factor infertility. Among the total 200 subjects included in the present study, male factor infertility was diagnosed in 99 patients. The presence of male factor infertility in 49.5 % of present study subjects was similar to the finding of previous study conducted by Poongothai et al, at Singapore who quoted 50% involvement of male factor in infertile couples⁵. Mehta et al conducted a study upon prevalence of oligozoospermia and azoospermia, reporting 40-50% male factor infertility in metropolitan cities of India⁷. Schlegel advocates concurrent evaluation of man along with the woman in an infertile couple because he quotes that a male factor is the primary or contributing cause in 40% to 60% of cases⁸. In a study conducted in Turkey, male factor was responsible for infertility in 50% cases⁹. Kliesch studied male factor infertility in Germany that male partner was responsible for infertility in 50% of cases⁹. Among the 200 males, in present study group, 61(30.5%) were suffering from infertility due to male factor alone. This percentage is more than seen in the study of Kumtepe et al but in accordance with the findings of studies conducted by Mehta et al¹⁰. Male factor alone was found in 30% of cases in America¹¹. The figure quoted by Madar et al which is 25% and quoted by Bhasinis 20% infertility due to male factor alone^{12,13}. In present study, female factor alone was present in 24% of couples only. This was in accordance with the systematic review conducted by Agrawal who reported 2% female factor in different countries¹⁴. The presence of infertility factor in both the male and female partners of a couple was seen in 19% of couples in present study. It is in accordance with the study conducted in Nigeria by Ikechebelu et al who reported 20% of

occurrence of infertility in both partners¹⁴ and in Mongolia, which shows 18.8% infertility due to female factor¹⁵. The couples which did not have any proven or diagnosed factors of infertility comprised of the group labeled as unexplained infertility. A couple whose infertility duration is more than 2 years with normal standard investigations is considered to be suffering from unexplained infertility¹⁶. Koide et al conducted a study in China and found that unexplained infertility was detected in 10-20% of cases¹⁷. In present study, couples suffering from unexplained infertility were 26.5%. This was in close proximity to the findings of a number of studies^{6,18}. Unexplained infertility in males may be due to sperm dysfunction or immunological factors¹⁸.

Semen analysis is the mainstay for the diagnostic workup in cases of male infertility³. In present study, the asthenozoospermia was present in 31.3%. This is comparable to the figure (32.3%) quoted by Ikechebelu et al in Nigeria¹⁹. While, 17.5% asthenozoospermia in Sudanese infertile males and 18.7% among infertile males in a sample population of Buenos Aires, Argentina has been reported^{20,21,15}.

In present study, azoospermia was present in 19.5%. Other studies like Mehta have quoted 19.9% in Mexico and 20% in Mongolia^{7,15}. In another study by Bhasin, the prevalence of azoospermia in Boston was 15-20%¹³. Azoospermia can either be obstructive or non-obstructive. To detect the cause of azoospermia it is mandatory to take history, do physical examination and perform hormonal assay FSH and testosterone)⁸.

In present study, oligozoospermia was seen in 23.2% of infertile males. In a previous study conducted by Mehta et al (2006), in certain regions of India the prevalence of oligozoospermia ranged between 15–30%⁷. Our result is different from figures in Nigeria (35% and 27.7%) reported by Ikechebelu et al¹⁹. In oligozoospermic males, sperm-zonapellucida interaction becomes faulty which results in decrease in fertility as well as fertilization rate²².

In the present study, teratozoospermia was present in 20.2% subjects. This finding resembles the finding (25.4%) of a study conducted in Thailand²³ In present study, OAT was present in 6.1% of cases. In Turkey a percentage of 5.83% was found and in Thailand OAT was present in 14.4% of cases^{10,23}. Hence, the present study revealed that occurrence of male factor infertility is quite high in a sample of local population.

CONCLUSION

The frequency of male factor infertility is quiet high among infertile couples, equally high is the frequency of unexplained infertility. Asthenozoospermia is the most common abnormality of semen parameters followed by Oligospermia, Tertozoospermia and Azoosprmia. It is high time to educate our males for undergoing semen analysis and other relevant thorough investigations to find out the cause of infertility to be successful in treating infertility sample.

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