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Original Article

Analysis of Semen Patterns in Male Partner of Infertile Couples

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ABSTRACT

The 40-50% infertility cases are reported to be because of the male partner. For the accurate investigation of the cause of infertility in couples, the semen analysis is considered as the effective and fundamental tool. It not only assesses the sperm maturity and formation, but also provide with the insights into the quality and production of sperm. **Objectives:** To analyze the semen pattern of the infertile male. **Methods:** It was a retrospective study conducted at the Gynecology and Obstetrician department of Khawaja Muhammad Safdar Medical College, Allama Iqbal Memorial Teaching Hospital Sialkot. The study was carried out by collecting data from male infertile patients that visited tertiary care unit for a duration of six months from July 2021 to December 2021. All participants were fully aware of the objective of the study; as written consent was taken from them. The abnormal features of semen were analyzed. The various features of oligozoospermia and normospermia were studied and it was found. **Results:** A total of 260 individuals participated in this study, among them there were 204 that had primary infertility issues and 56 had secondary infertility issues. There were just 2 infertile male partners that were greater than 50 years of age. It was found that there were 56% partners that had normozoospermia and 39% infertile partners having asthenozoospermia, then it was followed by azoospermia condition which was seen in 28% patients. **Conclusions:** It was found that the asthenospermia, oligoasthenozoospermia and azoospermia are some of the contributors of male infertility.

INTRODUCTION

The infertility is defined as inability to conceive even after one year of regular and unprotected intercourse. The 8-12% couple in the world are experiencing the infertility issues. The male partner contributes to more infertility cases than female. The 40-50% infertility cases are reported to be because of the male partner. Infertility is a global concern. It incidence varies globally with the geography and other parameters [1, 2]. Asthenozoospermia is defined as the infertility condition in which the sperm motility reduced to less than 40%. The progressive motility also reduced to less than 30%. Asthenozoospermia cases observed to be more sensitive in the nations with patriarchal societies. Different psychological and physical problems are associated with the infertility [3, 4]. It is common in both developing and developed nations. But the more social and physical problems are associated with infertility in the developing nations. The term oligoasthenozoospermia is defined as the decreased percentage of the motile spermatozoa in the sperm samples. It is the types of sperm disorder that effects both sperm count and sperm motility. It is common observation that in the middle-income countries the female partner are blamed of the infertility, and the male being superior usually don't underwent through evaluation and tests. The infertility condition in which there is no measurable sperm count in male semen is termed as

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azoospermia. The hormonal imbalance and blockage along the reproductive tract can leads to azoospermia. The less severe form of the azoospermia is defined as oligozoospermia. The sperm count reduced to less than 15 million sperms per ml. If the spermatozoa with the abnormal morphology are present in the sperm sample the condition is defined as teratozoospermia. The reactive oxygen species ROS and DNA fragmentation are considerd as the sperm damage marker that are the cause of the teratozoospermia. The condition in which semen sample has all disorder such as low sperm count known as oligozoospermia, the abnormal morphology known as teratozoospermia and the poor motility known as asthenozoospermia, this condition is normally named as oligoasthenoteratozoospermia. In the infertility couple the semen analysis is an indispensable evaluation. In order to assess the male infertility the semen analysis is considered as a standard technique [5-7]. The type of semen analysis in which the values of all ejaculates parameters are observed to be normal is defined as normospermia. The infertility condition in which semen (ejaculate) volume are measured to be lesser than 1.5ml is defined as hypospermia. If the semen volume produced during ejaculation are larger than 2.5ml the infertility condition is known as hyperspermia. For managing the male factors infertility, the semen parameter interpretation can be prove to be the effective tool. It is a standard line investigation. In order to determine the functional parameters of the ova and spermatozoa there is need to determine the sperms parameters. The exact etiology of the male infertility is not properly understood in most of the cases. The sexual dysfunction and sexually transmitted diseases are the factors associated with the male infertility. The study aimed to analyze the abnormal semen analysis pattern in the infertile couples. For the accurate investigation of the cause of infertility in couples, the semen analysis is considered as the effective and fundamental tool [8, 9]. It not only assess the sperm maturity and formation, but also provide with the insights into the quality and production of sperm. It is a sensitive test with the approximately 90% sensitivity. It can detect every 9 out of the 10 men with the infertility issues. The abnormality in the sperm production control mechanism at testicular level can leads to the decreased sperm count. The low sperm count levels and the poor quality of the semen are the two factors that accounts for the approximately 90% cases of male infertility. The increasing prevalence of the sexually transmitted diseases are ultimately effecting the quantity and quality of the semen. The oligospermia incidence are reported to be 21% while incidence of the azoospermia is 13%. The scare and limited data is available about the male infertility, its incidence and different parameters effecting the fertility of the male [10]. Therefore the study was conducted to evaluate the semen parameters of the infertile couples.

METHODS

It was a retrospective study conducted at the Gynecology and Obstetrician department of Khawaja Muhammad Safdar Medical College, Allama Iqbal Memorial Teaching Hospital Sialkot. The study was carried out by collecting data from male infertile patients that visited tertiary care unit for a duration of six months. All participants were fully aware of the objective of the study; as written consent was taken from them. The abnormal features of semen were analyzed. The various features of oligozoospermia and normospermia were studied. The institution ethical and review board committee approved the study. According to inclusion criteria, followings infertile males were selected for the study;

- The couples who visited the hospital for infertility problems.
- The couple experiencing infertility from more than 1.5 years.

The semen sample were collected from the infertile male. The sample were stored in the plastic container and semen analysis was performed in accordance to the methodology and guideline provided by the WHO. The sample was delivered to the lab of the institute within the one hour of the collection where these sample were processed further. The sperm quality and quantity including the motility, concentration and morphology was assessed. The data was collected from the infertile couple's male partner who attended the hospital. The data was recorded by using Microsoft word and excel than the SPSS software was used for the stratification of the data. The confidence interval of 95% was taken. The t-test was performed for the comparison of the data. The results were depicted in the percentage, mean and frequency.

RESULTS

The study was carried out by collecting data from male infertile patients. The primary infertility is defined as condition in which the women failed to conceive even the first child. Whereas as the secondary infertility is defined as the condition in which the women conceived for the first time but failed to conceive the second child. The 260 individuals selected for the study, out of them 204 that had primary infertility issues and 56 had secondary infertility issues as shown in table 1.

Features		N (%)
Infertility kinds	Primary infertility	204 (78%)
	Secondary infertility	56 (21%)

Table 1: Demographic features of infertile male n=260

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There were 145 individuals that were between 20-30 age group and only four of them were below 20 age group. There were just 2 infertile male partners that were greater than 50 years of age as shown in table 2.

Age in years	N (%)
Less than 20	4 (1.5%)
20-30	145 (55%)
30-40	100 (38%)
40-50	10 (3.8%)
Greater than 50	2 (0.6%)

Table 2: Age distribution chart

The abnormal features of semen were analyzed and it was found that there were 56% partners that had normozoospermia and 39% infertile partners having asthenozoospermia, then it was followed by azoospermia condition which was seen in 28% patients. oligoasthenozoospermia was found in 17% individuals as shown in table 3. The 4 individuals were included in oligoasthenoteratozoospermia category as shown in table 3.

Semen irregularities	N (%)
Asthenozoopermia	45 (39%)
Azoospermia	33 (28%)
Oligoasthenozoospermia	20 (17%)
Oligozoospermia	10 (8%)
Oligoasthenoteratozoospermia	4 (3%)
Teratozoospermia	2 (1.7%)

Table 3: Analysis of irregular semen features

The various features of oligozoospermia and normospermia were studied and it was found that the features like age of patient, progressive and total immotility and total count values were significant. However, there was no statistically significant difference found between volume of both groups.

	Normospermia	Oligospermia	p-value
	Mean ±SD (95%CI)	Mean ±SD (95%CI)	
Volume	2.4±0.8	2.4±1.1	0.33
	(2.4-2.7)	(2.2-2.7)	
Total count	45±22	7.1±3.9	0.00
	(45-48)	(6.2-8)	
Progressive motility	46±24	19.2±22.1	0.00
	(44.2-50)	(13-23.4)	
Immotility	31±21.3	54.3±23.4	0.00
	(32.1-5.4)	(48-68)	
Age	31±5.3	28.6±4.5	0.03
	(28.3-29)	(28.2-31.1)	

Table 4: Comparing the semen parameters between oligozoospermia and normozoospermia

DISCUSSION

In this study the primary infertility was found in 78% individuals. As per a previous study carried out 88% men suffered from primary infertility and only 11% had secondary infertility issues [11]. But another study demonstrates that secondary infertility was dominant among their study group where 58% infertile partners have secondary infertility issues [12]. In this study it was reported that there were 44% patients having similar abnormalities like the abnormality called as asthenozoospermia. It was found among 39% male patients and 28% suffered from azoospermia. Oligoasthenozoospermia was reported among 17% cases. as per a study carried out to find the types of infertility issues among infertile male partners it was found that majority of the cases had asthenozoospermia abnormality (27%), it was then followed by oligozoospermia which was observed among 6% cases. In our study azoospermia was found in 28% individuals but this value is greater than the data reported by previous studies, where azoospermia was 14%, however another study shows that azoospermia was found in 38% infertile partners [13-15]. As per studies, sperm count is not the only issue responsible for male infertility there are other features as well like in case of azoospermia there is damage to the male reproductive tract or there is defective sperm production [16]. Some other features that can be the reason for male infertility are semen viscosity, the volume of semen, the morphology and the motility [17]. The average sperm concentration in case of normozoospermia is 45±22 whereas in oligozoospermia it is 7.1±3.9. The progressive motility in normozoospermia is 46±24, and in oligozoospermia it is 19.2±22.1. Both of these findings are in accordance with the previous results [18]. All the data was collected by fulfilling the major criteria of WHO and sterile containers the analysis was done by the department of pathology where WHO designed parameters were used for laboratory examinations. Similar procedures are sued by other studies as well. The features like viscosity, concentration, volume and motility were measured. As per some studies, male partners usually hesitate to get their infertility check-up as compared to the female partners [19]. There were few patients that were reluctant for sample collection. Most of the cases belonged to normozoospermia and the cause of infertility could be any other issue related to semen like viscosity, volume, count etc. The ejaculated volume of semen in case of oligozoospermia and normozoospermia came out to be 2.4±1.1 and 2.4±0.8 respectively. The semen volume came out to be normal in both of these group. There was no major difference in volume of semen was observed in oligozoospermia and normozoospermia. Progressive motility and total count is however very less in case of oligozoospermia as compared to normozoospermia. In a study carried out to find the semen related abnormalities in infertile male partners it was found that the semen volume remains normal in normozoospermia and oligozoospermia

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cases [20]. Among the cases reported in this study there were 90% male partners that had normozoospermia and only 7% suffered from hypospermia with 1% having hyperspermia. As per a study the ethnicity factor was also studied to find if there exist any relation between ethnicity and semen related abnormalities, it was found that Brahmin-chhetri group had the most of the semen related abnormalities however, there was no significant association found between ethnicity and semen abnormalities [21]. Primary and secondary both kinds of procedures and techniques were used by pathology department to check all the parameters of samples. In our study the male infertility related to semen abnormalities are studied but there was no analysis done to find the cause of possible infertility. Further study is required to explain how the semen related abnormity can play its role in causing infertility and also about the cause of emergence of these abnormalities.

CONCLUSIONS

The study was conducted to find the semen analysis pattern of the infertile male partners it was found that the asthenospermia, oligoasthenozoospermia and azoospermia are some of the contributors of male infertility. Azoospermia was related to damage of male reproductive tract leading to infertility. In some cases, there was defective and abnormal production of sperms. In most of the patients there are normozoospermia followed by hypospermia and hyperspermia. The features like viscosity, count, concentration/volume of semen also play role in contributing to infertility.

Conflicts of Interest

The authors declare no conflict of interest

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