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Frequency of Abnormality of Semen in Infertile Couple

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Abstract

Background: Infertility is a significant global health concern affecting approximately 10–15% of couples, with male factors contributing to nearly half of all cases. Semen analysis remains the cornerstone investigation for evaluating male infertility, providing key insights into sperm concentration, motility, and morphology. This study aimed to determine the frequency and pattern of semen abnormalities among male partners of infertile couples.

Methodology: This descriptive cross-sectional study was conducted at a tertiary care hospital over a period of 6 months. A total of 200 male partners of infertile couples, aged 24–40 years, were included. Infertility was defined as failure to conceive after at least 12 months of regular unprotected intercourse. Semen samples were collected following 2–5 days of abstinence and analyzed according to WHO 2010 guidelines. Data were analyzed using SPSS version 27, and frequencies and percentages were calculated.

Results: The mean age of participants was 32.4 ± 5.8 years, with a mean duration of infertility of 3.2 ± 1.6 years. Primary infertility was observed in 66% of couples, while 33% had secondary infertility. Normal semen parameters were found in 39% of participants, whereas 61% showed abnormalities. Among abnormal cases, asthenozoospermia was the most common finding (36.1%), followed by oligozoospermia (24.6%), teratozoospermia (16.4%), and azoospermia (14.8%). Combined abnormalities (oligoasthenoteratozoospermia) were observed in 8.2% of patients.

Conclusion: The study demonstrates a high prevalence of abnormal semen parameters among male partners of infertile couples, with sperm motility defects being the most common abnormality.

Introduction

Male variables, either alone or in conjunction with female factors, account for almost 40–50% of cases of infertility, a significant global health issue that affects 10–15% of couples globally [1,2]. The primary test for assessing male infertility is still semen analysis, which offers crucial details on sperm concentration, motility, morphology, and vitality [3].

Male partners of infertile couples often exhibit aberrant semen parameters, such as oligozoospermia (low sperm count), asthenozoospermia (reduced motility), teratozoospermia (abnormal morphology), and azoospermia (total absence of sperm) [3,4]. These anomalies are a major contributor to infertility and severely reduce fertilization potential.

Variable populations have variable frequency of semen anomalies, according to several research. About 30.5% of male infertiles had aberrant semen parameters, according to Garg et al. [5], although Kulkarni and Kulkarni found a higher frequency of 43.6% [6]. A lower prevalence of about 20% was observed by Pant, indicating regional variation as well as the impact of lifestyle and environmental factors [7]. Asthenozoospermia is the most common anomaly among infertile guys, followed by oligozoospermia and azoospermia, according to additional research [8,9].

Deterioration in semen quality has been linked to a number of risk factors, including smoking, alcohol use, obesity, infections, occupational exposure, and environmental pollutants [2,10]. Hormonal balance, sperm function, and spermatogenesis may all be impacted by these variables. Determining the incidence and pattern of semen abnormalities is crucial for early diagnosis, timely treatment, and better reproductive results because male factors significantly contribute to infertility.

Methodology:

This descriptive cross-sectional study was conducted in the Department of Obstetrics and Gynecology/Pathology at a tertiary care hospital over a period of 6 to 12 months. The study population consisted of male partners of infertile couples who presented to the infertility clinic. Infertility was defined as the failure to conceive after at least 12 months of regular unprotected intercourse. Male partners aged between 24 and 40 years who consented to participate were included in the study, while individuals with a history of vasectomy, known chromosomal or genetic abnormalities, or severe systemic illness were excluded.

A sample of 200 participants were included based on previously published studies (5,6). Data were collected through detailed history taking, including age, duration of infertility, and lifestyle factors such as smoking and alcohol use, followed by physical examination. Semen samples were collected from participants after 2–5 days of sexual abstinence in sterile containers. The samples were analyzed according to the World Health Organization (WHO) 2010 guidelines for semen analysis.

The parameters assessed included semen volume, sperm concentration, motility, morphology, and vitality. Abnormal semen parameters were defined as oligozoospermia (low sperm concentration), asthenozoospermia (reduced motility), teratozoospermia (abnormal morphology), and azoospermia (complete absence of sperm). The collected data were entered and analyzed using Statistical Package for Social Sciences (SPSS) version -27. Frequencies and percentages were calculated for categorical variables, and Mean $\pm$ sd was calculated for quantitative data.

Results:

A total of 200 male partners of infertile couples were included in this study. The mean age of the patients was 32.4 ± 5.8 years, while the mean duration of infertility was 3.2

± 1.6 years. Regarding the type of infertility, the majority of couples, 134 (66%), had primary infertility, whereas 66 (33%) presented with secondary infertility **(Table#1)**.
Semen analysis revealed that 78 (39%) participants had normal semen parameters, while a larger proportion, 122 (61%), exhibited abnormal semen findings, indicating a high frequency of male factor involvement in infertility in this population **(Table#2)**.
Among those with abnormal semen parameters (n = 122), the most common abnormality observed was asthenozoospermia, found in 44 (36.1%) patients. This was followed by oligozoospermia in 30 (24.6%) cases and teratozoospermia in 20 (16.4%) patients. Azoospermia was identified in 18 (14.8%) individuals. Additionally, a combination of abnormalities, specifically oligoasthenoteratozoospermia, was observed in 10 (8.2%) patients.
Overall, the findings demonstrate that abnormalities in sperm motility were the most prevalent, followed by sperm count and morphology defects, with a smaller proportion showing complete absence of sperm or combined abnormalities **(Table#2)**.

Table#1: Baseline Data of the Patients

Baseline Data	**n (%)/(Mean ± sd)**
Age **(years)**	32.4 ± 5.8
Duration of infertility **(years)**	3.2 ± 1.6
Type of fertility	
• Primary	134 (66%)
• Secondary	66 (33%)

Table#2: Frequency of Normal vs Abnormal Semen Parameters (n = 200)

Semen Analysis	**n (%)/(Mean ± sd)**
Normal	78 (39%)
Abnormal	122 (61%)

Table 3: Pattern of Semen Abnormalities (n = 122)

Type of Abnormality	**n (%)**
Asthenozoospermia	44 (36.1%)
Oligozoospermia	30 (24.6%)
Teratozoospermia	20 (16.4%)
Azoospermia	18 (14.8%)
Oligoasthenoteratozoospermia (combined)	10 (8.2%)

Discussions:
With 61% of patients exhibiting aberrant semen characteristics, the current study emphasizes the significant role that male variables play in infertility. This result is consistent with estimates that male factor infertility accounts for around 40–50% of cases of infertility globally [2,11]. Infertility examination is frequently sought during the early reproductive years, as evidenced by the cohort's relatively youthful mean age of 32.4 ± 5.8 years and mean infertility duration of 3.2 ± 1.6 years, which are comparable to regional and international data [12].
Primary infertility (66%) was more common than secondary infertility (33%) in this study, which is in line with other research from underdeveloped nations where sociocultural variables and delayed access to healthcare may affect early detection and treatment [13]. The prevalence of primary infertility may also be a result of environmental factors influencing spermatogenesis or underlying untreated male reproductive diseases [14].
The high frequency of aberrant semen parameters (61%) is one of the study's significant findings, which highlights the value of semen analysis as a first-line, affordable diagnostic technique in the assessment of infertility [15].

Asthenozoospermia (36.1%) was the most common abnormality. Since sufficient motility is necessary for sperm transport and successful fertilization, reduced sperm motility has been extensively documented as a major cause of male infertility [16]. Other regional investigations have reported similar results, with motility abnormalities being the predominant anomaly [17].

The second most prevalent anomaly, oligozoospermia (24.6%), indicates reduced sperm production and has been linked to environmental pollutants, genetic factors, and hormonal abnormalities [18]. Another noteworthy condition in this population was teratozoospermia (16.4%), which is defined by aberrant sperm morphology. Fertilization potential may be decreased by morphological flaws that hinder the sperm's ability to enter the ovum [19]. Despite being less common, azoospermia (14.8%), which is the total lack of sperm, is nonetheless clinically noteworthy because of its high correlation with severe testicular or obstructive disease [20].

A more severe impairment of spermatogenesis is indicated by the presence of mixed abnormalities (oligoasthenoteratozoospermia) in 8.2% of patients, which is frequently linked to worse reproductive outcomes [21]. This emphasizes how male infertility is complex, affecting several semen characteristics at once.

The prevalence of motility problems in this study points to potential underlying etiologies that have been demonstrated to negatively impact sperm function, such as oxidative stress, infections, varicocele, or lifestyle variables including smoking and exposure to the environment [22]. The observed patterns may be significantly influenced by these factors, given the growing environmental and occupational dangers in metropolitan settings.

Overall, the results of this study are in line with previous research, highlighting the fact that anomalies in semen, especially those that impact motility and count, are significant causes of male infertility. These findings highlight the necessity of focused therapies, lifestyle changes, and early screening to enhance reproductive outcomes. Additionally, in patients with severe or combination problems, a thorough examination that includes hormonal, genetic, and imaging testing may be necessary to direct suitable therapeutic methods [23].

This study's main advantages are its sufficient sample size and thorough description of semen abnormalities, which offer important local information that adds to the scant regional literature on male infertility. Its single-center design, lack of advanced diagnostic evaluation (such as hormonal profiling, genetic testing, and assessment of oxidative stress), and lack of longitudinal follow-up to evaluate treatment outcomes are some limitations that should be noted, though, as they may restrict the generalizability and depth of interpretation. In order to better understand underlying causes, it is advised that male partners be routinely and early assessed during infertility workups. Future research should also include multicenter designs, larger populations, and sophisticated diagnostic methods. To lessen the burden of male infertility and enhance reproductive outcomes, public health initiatives that emphasize awareness, lifestyle modification, and early intervention are crucial.

Conclusion:

With aberrant semen parameters found in 61% of participants—most notably asthenozoospermia, followed by oligozoospermia and teratozoospermia—this study concludes that male factor infertility is highly prevalent, with sperm motility being the most affected parameter. These results highlight how important routine semen analysis is for the early assessment of infertile couples.

References:

World Health Organization. WHO laboratory manual for the examination and processing of human semen. 5th ed. Geneva: WHO; 2010.

Agarwal A, Mulgund A, Hamada A, Chyatte MR. A unique view on male infertility around the globe. Reprod Biol Endocrinol. 2015;13:37.
Khan A, Sajjad Z, Yousaf S, Ahmed A, Sana F, Sana F. Semen analysis; cornerstone in evaluating infertility. Pak Armed Forces Med J. 2021;71(6):1-6.
Cooper TG, Noonan E, von Eckardstein S, Auger J, Baker HW, Behre HM, et al. World Health Organization reference values for human semen characteristics. Hum Reprod Update. 2010;16(3):231–45.
Garg J, Meena R, Shukla S, Sharma S, Choudhury R. Abnormal semen parameters among males in infertile couples: a cross sectional study from a tertiary care centre. Int J Reprod Contracept Obstet Gynecol. 2020;9(9):1-5.
Kulkarni SN, Kulkarni NV. Study of semen parameters in male partners among infertile couples. Int J Reprod Contracept Obstet Gynecol. 2015;4(5):1-6.
Pant PR. Abnormal semen parameters among men in infertile couples. Nepal J Obstet Gynaecol. 2013;8(1):53–55.
Ali AFM, Modawe G, Rida MA, Abdrabo AA. Prevalence of abnormal semen parameters among male patients attending fertility center in Khartoum. J Med Life Sci. 2022;4(1):1-8.
Fayyaz A, Tabassum S, Qadir SY. Frequency of male factor and abnormalities of semen analysis in infertile couple. Prof Med J. 2020;27(7):1-6.
Suman F, Hassan L, Javed A, Khan N. Abnormal semen parameters and association with natural conception. J Soc Obstet Gynaecol Pak. 2022;12(2):1-6
Thonneau P, Marchand S, Tallec A, Ferial ML, Ducot B, Lansac J, et al. Incidence and main causes of infertility in a resident population. Hum Reprod. 1991;6(6):811–6.
Mascarenhas MN, Flaxman SR, Boerma T, Vanderpoel S, Stevens GA. National, regional, and global trends in infertility prevalence. PLoS Med. 2012;9(12):e1001356.
Inhorn MC, Patrizio P. Infertility around the globe: new thinking on gender, reproductive technologies and global movements. Hum Reprod Update. 2015;21(4):411–26.
Skakkebaek NE, Rajpert-De Meyts E, Main KM. Testicular dysgenesis syndrome. Hum Reprod. 2001;16(5):972–8.
World Health Organization. WHO laboratory manual for the examination and processing of human semen. 6th ed. Geneva: WHO; 2021.
Cooper TG, Noonan E, von Eckardstein S, Auger J, Baker HW, Behre HM, et al. World Health Organization reference values for human semen characteristics. Hum Reprod Update. 2010;16(3):231–45.
Ahmad N, Akhter S, Iqbal S, et al. Semen analysis of infertile men in Pakistan. J Pak Med Assoc. 2013;63(5):558–62.
Jarow JP, Sharlip ID, Belker AM, Lipshultz LI, Sigman M, Thomas AJ, et al. Best practice policies for male infertility. J Urol. 2002;167(5):2138–44.
Kruger TF, Acosta AA, Simmons KF, Swanson RJ, Matta JF, Oehninger S. Predictive value of abnormal sperm morphology. Fertil Steril. 1988;49(1):112–7.
Esteves SC, Miyaoka R, Agarwal A. An update on the clinical assessment of the infertile male. Clinics (Sao Paulo). 2011;66(4):691–700.
Guzick DS, Overstreet JW, Factor-Litvak P, Brazil CK, Nakajima ST, Coutifaris C, et al. Sperm morphology, motility, and concentration in fertility prediction. N Engl J Med. 2001;345(19):1388–93.
Agarwal A, Virk G, Ong C, du Plessis SS. Effect of oxidative stress on male reproduction. World J Mens Health. 2014;32(1):1–17.
Jungwirth A, Diemer T, Dohle GR, Giwercman A, Kopa Z, Krausz C, et al. EAU guidelines on male infertility. Eur Urol. 2012;62(2):324–32.