

Prevalence of Abnormal Semen Analysis in Patients of Infertility in a Tertiary Care Hospital

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Received: 25-09-2022 / Revised: 22-10-2022 / Accepted: 19-11-2022

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Conflict of interest: Nil

Abstract

Background: More than 70 million couples worldwide are affected by infertility. With a male factor infertility accounts for about half of the cases. Semen analysis is the first step to identify male factor infertility.

Objective: The objective of this study was to determine the prevalence and patterns of male factor infertility based on semen analysis in patients visiting Karpaga Vinayaga Institute of Medical Sciences with infertility complaints.

Materials and Methods: This is a retrospective, descriptive cross sectional hospital based type of study conducted on 100 males who attended the infertility clinic at Karpaga Vinayaga Institute of Medical Sciences. Semen analysis was performed for them to assess the quality of semen according to WHO criteria. The descriptive statistics and frequency studies were conducted using the SPSS version.

Results: Out of total 100 patients, 58(58%) partner showed abnormal semen parameter and remaining 42 (42%) showed normal semen report. This indicates that contribution of male pattern infertility was 58% in infertile couple who were taken for the study. Out of 58patients, 37.93% patients showed oligozoospermia, which was the common abnormality detected. In our study maximum patients were from 30-40 years of age group. It is also observed that obese patients had lower number of sperm count.

Conclusion: The prevalence of male factor infertility was found to be a little higher. Further prospective studies to determine the risk factors for male infertility is highly recommended.

Keywords: Prevalence, semen analysis, male infertility.

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Introduction

The WHO defined infertility as the inability to conceive a child after 1 year of regular, unprotected intercourse. Approximately

50% of cases of infertility can be attributed to male factors [1]. It is difficult to estimate the prevalence of male infertility mainly due

to the patriarchal society in which a female partner is mostly held responsible for infertility [3]. The factors contributing to male infertility can be due to biological factors, such as, testicular failure, cryptorchidism, genetic problems, or social factors, such as, contraceptive usage, stress, and age of marriage [4]. Infertility can be categorized as primary infertility and secondary infertility. The former is a failure to achieve a successful pregnancy leading to live birth, whereas the latter is defined as the condition when a woman with a prior history of a successful pregnancy cannot bear a child [2]. In India, the prevalence of primary infertility ranges from 3.9% to 16.8% [5].

Semen analysis, an essential procedure to assess male fertility, is the foremost fundamental assessment test that produces most of the data regarding testicular function, maturation of sperm, and functioning of the accessory glands [6]. The present study is aimed at finding the incidence of different sperm abnormalities in men of infertile couples who visited for treatment in our center.

Materials and Methods:

The current study includes a total of 100 couples who visited the Karpaga Vinayaka institute of medical sciences between January 2022 and June 2022 for evaluation

and treatment of infertility. This study was conducted to find the prevalence of different sperm abnormalities and distribution of semen parameters in infertile men visiting our center.

A detailed history of these couples was taken in a proforma inclusive of age, marital status, years of marriage, family history, occupation, medical history, smoking, drinking, primary or secondary infertility, varicocele, surgical history for any illness, etc. Informed verbal consent was obtained from all the patients who were considered for the study. They were counseled regarding semen analysis as well as regarding the abstinence to be maintained for 2–7 days before semen analysis. Instruction for proper semen collection was provided before sample collection. The sample was collected by masturbation in a sterile wide-mouthed container. Semen analysis was performed as described in the WHO laboratory manual for the examination and processing of human semen, 5th Edition, 2010 [13]. The lower reference limit for normal semen analysis is given in Table 1. Semen parameters, such as, volume, appearance, viscosity, pH, sperm concentration, motility, morphology, and vitality, were determined. The results were evaluated and categorized with reference as in Table 2.

Table 1: Lower reference limit of semen analysis Semen analysis-WHO 2010*

Parameter	Lower reference limit
Volume	1.5 ml
pH	7.2
Sperm concentration	>15million/ml
Total sperm count	39 million/ejaculate
Total motility	40%
Progressive motility	32%
Morphology	4%(strict criteria)
Vitality	58%

*WHO laboratory manual for the examination and processing of human semen

Table 2: Nomenclature in sperm quality*

Asthenozoospermia	Percentage of progressively motile sperm is below the lower reference limit
Asthenoteratozoospermia	Percentages of progressively motile as well as morphologically normal sperm is below the lower reference limits

Azoospermia	No sperm in the ejaculate
Normozoospermia	Total number of sperms with a percentage of progressively motile and morphologically normal sperm equals to or above the lower reference limits
Oligoasthenozoospermia	Total number of sperms and percentage of progressively motile sperm below the lower reference limits
Oligoasthenoteratozoospermia (OAT)	Total number of sperms with percentages of progressively motile and morphologically normal sperm is below the lower reference limit. 5–14 million/mL <4% morphology and progressive motility <32%
Oligozoospermia	Total number of sperms is below the lower reference limit
Oligoteratozoospermia	Total number of sperms and percentage of morphologically normal sperm is below the lower reference limits
Teratozoospermia	Percentage of morphologically normal sperm is below the lower reference limit

Observation and results

Results:

Table 3: Patients with normal and abnormal semen parameter

S. No	Quality of semen	Number of patients
1	Abnormal semen	58 (58%)
2	Normal semen	42 (42%)

Table 4: Proportion of patients showing abnormal semen parameter

S. No	Abnormality	No of patients	Percentage
1.	Azoospermia	9	15.52
2.	Oligozoospermia	22	37.93
3.	Asthenozoospermia	17	29.31
4.	Teratozoospermia	6	10.34
5.	Cryptozoospermia	4	6.90
	Total	58	100

Out of total 100 patients, 58(58%) partner showed abnormal semen parameter and remaining 42 (42%) showed normal semen report. This indicates that contribution of male pattern infertility was 58% in infertile couple who were taken for the study. Out of 58 patients, 37.93% patients showed oligozoospermia, 15.52% azoospermia, 29.31% asthenozoospermia, 6.9% Cryptozoospermia and 10.34% teratozoospermia. In our study maximum patients were from 30-40 years of age group. It is also observed that obese patients had lower number of sperm count.

Discussion

The prevalence of male factor infertility among patients visiting our hospital with infertility problems was found to be 58%.

This result was almost similar to other studies conducted by Boivin J et al 2007 [10] showed 50%, Cooper TG et al. 2010 [11] reported 40–50%, Toragall MM et al. 2019; 50% [12]. This higher prevalence of male infertility could be mainly due to different social, environmental and psychological factors among the study participants requires detailed analysis and evaluation of the problem. [13]

Similar studies done by Joshi et al [7] in Bangalore, and P. R. Pant [8] in Nepal, also found oligozoospermia to be the most common abnormality.

Kruger et al [9] study revealed that approximately 4 % of infertile men have Isolated teratozoospermia as indicated by Tygerberg's strict criteria (< 5 percent of

normal forms) this is also nearly found to be like our observation. [14]

Conclusion:

Abnormal semen analysis remains a significant contribution to overall infertility in our environment. This study has demonstrated that abnormal semen quality is a major factor in our setup with 58% of male partners of infertile couples having abnormal semen parameters. While assisted reproductive techniques have advanced in recent years and allows couples to bypass semen quality issues by directly injecting sperm into an egg, this only treats the symptom and not the issue as such. By eliminating or reducing certain environmental or lifestyle factors, male fertility as a whole may decrease which requires further research.

References

- Gurunath S, Pandian Z, Anderson RA, Bhattacharya S. Defining infertility-a systematic review of prevalence studies. *Human reproduction update*. 2011 Sep 1; 17(5):575-88.
- Bhaduri (Bhattacharyya) N, Sarkar AP, Dewasi N, et al. Abnormalities in semen analysis among male partners of infertile couples: a study in a tertiary care level hospital of West Bengal, India. *Int J Reprod Contracept Obstet Gynecol*. 2015; 4(1):100-102.
- Jajoo S, Kalyani KR. Prevalence of abnormal semen analysis in patients of infertility at a rural setup in Central India. *Int J Reprod Contracept Obstet Gynecol*. 2013; 2(2):161-164.
- Joshi P, Gopal N, Bhat V. Study of semen analysis patterns in infertile males. *Int. J Pharm BiolSci*. 2011; 1(1): 44-49.
- Juneja P, Phukan PK, Changmai D. A study of abnormal semen parameters in infertile couples in Assam, India. *Int J Reprod Contracept Obstet Gynecol* 2019;8(3):997-1000.
- Richard I. Lifestyle impact and the biology of the human scrotum. *Reprod Biol Endocrinol*. 2007; 5:15.
- Joshi P, Gopal N, Bhat V.: Study of semen analysis patterns in infertile males. *Internal J Pharm Biol Sci*. 2011; 1(1):44-9
- Pant Padam Raj: Abnormal semen parameters among men in infertile couples. *Njog*. 2013;8(1): 53-5.
- Kruger, T.F., Acosta, A.A., Simmons, K.F., Swanson, R.J., Matta, J.F., and Oehninger, S. Predictive value of abnormal sperm morphology in vitro fertilization. *Fertil Steril*. 1988; 49: 112-117.
- Boivin J, Bunting L, Collins JA, Nygren KG. International estimates of infertility prevalence and treatment-seeking: potential need and demand for infertility medical care. *Hum Reprod* 2007; 22(6): 1506-12.
- 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;16:231-45.
- Toragall MM, Satapathy SK, Kadadevaru GG, Hiremath MB. Association of demographic and lifestyle factors with semen quality of men with fertility problems attending infertility center in North Karnataka. *Indian J Med Spec*. 2019; 10:79-83.
- Rutstein SO, Shah IH, Infecundity, infertility, and childlessness in developing countries. *DHS Comparative Reports No. 9*. Calverton, MD, USA: ORC Macro and the World Health Organization, 2004.
- Al-Rawee R., Al-Fathy D. M., & Bashir Alsabee, D. W. Delivering Integrated Health Care: Role and Importance of Multidisciplinary Team Clinic Role and Importance of Multidisciplinary Team Clinic in Nineveh Province. *Journal of Medical Research and Health Sciences*. 2022; 5(10): 2278-2294.