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Original Research Article

A Retrospective Study of Infertility Patterns Based on Semen Analysis in Patients Presenting in a Tertiary Care Centre

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Abstract

Background: Perception of infertility is a major taboo & stigma in Indian society. Using WHO standards this study aimed to evaluate seminal fluid parameters in the male partners of the infertile couples presenting to the infertility clinic in a Tertiary Care Centre.

Materials and Methods: In this retrospective study, patients who attended the infertility clinic in our Medical College Hospital from 2018 to 2021 were included in this study. Semen sample of 110 patient was collected and the wet preparation was made to determine the concentration sperm motility, sperm vitality, sperm numbers, concentration, motility, morphology, viability, and the presence of WBC or RBC. Data was collected & analyzed using Microsoft Excel & appropriate statistical tests were applied wherever necessary.

Results: The average age of the participants in this study was 30 years, ranging from 21 to 50. The mean semen volume is 2.76 ml, sperm concentration 42.4 million/ml and vitality 38.7% of the semen. Abnormal semen was seen in 63 (57.27%). According to age-wise distribution maximum cases of oligospermia 13(11.8%) were between the age group of 20-35 years and second common abnormal sample finding is Asthenozoospermia 12.7%.

Conclusion: Oligospermia is most common abnormality that causes male infertility after Asthenozoospermia, and routine semen analysis is the still gold standard for detection of male infertility in developing country like India. One main significant factor for male infertility is poor quality of semen.

Keywords: Male Infertility, Seminogram, Semen Analysis

Introduction

Married couple in Indian society tries to conceive mostly in one to two years after marriage. As marriage & Children forms one of the basic societal norms, if this does not occur, they face shame in society, and it feels like impotency in male which is unacceptable in Indian society and makes it a social stigma.

According to the International Committee for Monitoring Assisted Reproductive Technology (ICMART) and the World Health Organization (WHO), Infertility is defined as "disease of the reproductive system defined by the failure to achieve a clinical pregnancy after 12 months or more of regular unprotected sexual intercourse [1].

The Indian Society of Assisted Reproduction presents that "infertility currently affects about 10 to 14 percent of the Indian population, with higher rates in urban areas where one out of six couples are impacted. Nearly 27. 5 million couples actively trying to conceive suffer from infertility in India [2].

Anthony Hirsh states that "Idiopathic oligoasthenoteratozoospermia is the commonest cause of male subfertility. Although sexual function is normal, there is a reduced count of mainly dysfunctional spermatozoa [3].

Infertility in males is a global issue with prevalence percentages varying from one region to another. Deficiencies in semen and poor semen quality are the prime causes of infertility in men. According to the National Institutes of Health (NIH), infertility affected ~15% couples, i.e., ~48.5 million couples, worldwide [4].

This study aimed to evaluate seminal fluid parameters in the male partners of the infertile couples presenting to the infertility clinic in a Tertiary Care Centre.

Material and Method

In this retrospective study patient who attends the infertility clinic in our Medical College Hospital from 2018 to 2021 were included in this study.

In this study we have taken complete liquefaction semen sample within 30-60 minutes at room temperature, homogenous white opalescent appearance. A good sperm consistency is demonstrated by semen living the pipette as drop by drop, semen volume greater or equal to 2 ml and a pH≥7.2.

Semen sample of 110 patient collected in clean container within three –four days of sexual abstinence and submitted in central lab of pathology department within 05 minute of collection we checked the volume, color and pH of specimen and note down the liquefaction time after liquefaction of semen sample we prepare for the sperm counting by adding semen diluting fluid and check the vitality, motility and morphology of sperm at 37^{o}c.

The wet preparation was made to determine the concentration sperm motility, sperm vitality, sperm numbers, concentration, motility, morphology, viability, and the presence of WBC or RBC. Motility of sperm is graded as immotile (IM) for non-motile sperm and non-progressive motile (np) for slow sperm but not move forward and progressive motile (pr) fast forward moving sperm.

The terms "sperm concentration" and "sperm count" used in the study are not the same, although the terms are often used interchangeably. Sperm concentration is the number of sperm/ml in a semen sample. The number of sperm/ml in a sample is typically determined by counting sperm in a counting chamber. According to the WHO 5th edition, the lower reference limit for sperm concentration is 15 x 10^{6} spermatozoa/ml. Sperm count is the total number of sperm in the entire ejaculation.

Other typical values include a concentration of at least 20-30 million sperm cells per

milliliter, a motility of at least 50% with forward progression and morphology of at least 30% forms according to WHO parameter

For determining the sperm count, sperm concentration is multiplied by the total sample volume submitted. The lower reference limit for sperm count is 39 x 10^6 spermatozoa per ejaculate. Result data collected & analyzed using Microsoft Excel. Appropriate statistical tests were applied wherever necessary.

Result

In this study from January 2018 to January 2021 period, 110 males visited the Tertiary care centre infertility clinic. The average age of the participants in this study was 30 years, ranging from 21 to 50. Over fifty five percent of the patients (n=61) were in the 20 to 30 year age group among the study population.

The mean semen volume is 2.76 ml, sperm concentration 42.4 million/ml and vitality 38.7% of the semen Table (1). Low semen volume was in 28 males (25.45%). According to who standard for semen normality all above sample analyzed out of these 47 (42.72%) had normozoospermia as shown in Fig 1. Age-wise distribution of semen volume, concentration, and vitality among the study population are shown in Table (2).

Table 1: Distribution of cases on basis of semen defects semen pattern

Sperm pattern	Number of cases	%
Normozoospermia	47	42.7
Oligospermia	21	19.2
Azoospermia	06	5.5
Asthenozoospermia	14	12.7
Teratozoospermia	03	2.7
Oligoasthenoteratozoospermia	01	0.9
Total	110	100

Table 2: Age-wise distribution of semen volume, concentration, and vitality among the study population (n=110)

Age	Vol.<1.5	Vol.>1.5	Con.<15mill/ml	Con>15mill/ml	Vitality<58%	Vitality>58%
20-30	12	49	16	45	13	48
31-40	12	28	04	42	04	39
41-50	4	05	01	02	01	05
Total	28 (25.45%)	82 (74.55%)	21 (19%)	89 (81%)	18 (16.4%)	92 (83.6%)

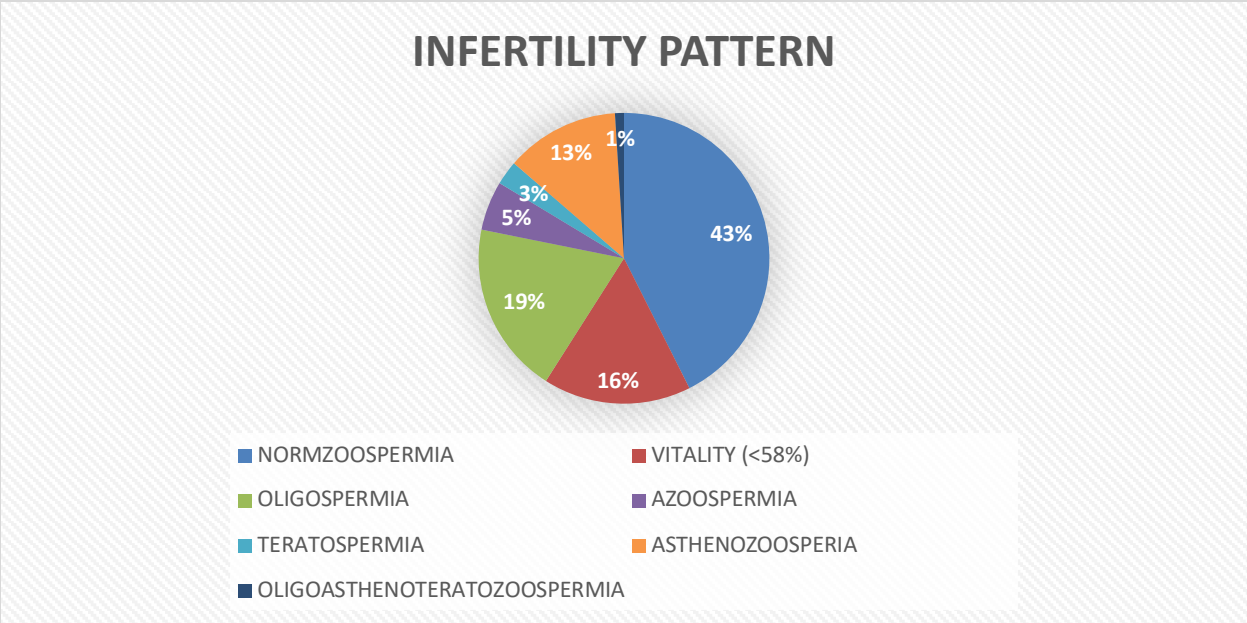

Figure 1

An abnormal semen was seen in 63 (57.27%). According to age-wise distribution maximum cases of oligospermia 13(11.8%) were between the age group of 20-35 years and second common abnormal sample finding is Asthenozoospermia 12.7% as shown in Table (3).

Also, other findings are azoospermia (5.5 %), Teratozoospermia (2.7 %), whereas a single case of oligoasthenoteratozoospermia (0.9 =1%) found in 31-40 year age group (Table 2 & 3).

Table 3: Age-wise distribution of semen parameters

Age	Oligozoospermia	Teratozoospermia	Azoospermia	Asthenozoospermia	Oligoasthenoteratozoospermia	Normozoospermia
20-30	13	0	03	10	0	35
31-40	07	2	02	2	01	11
41-50	01	1	01	2	0	01
Total	21(19.2)	3(2.7)	6(5.4%)	14(12.7%)	1(0.90%)	47(42.7)

Discussion

About 30% cases of infertility are due to problem with the males [3]. Availability for semen analysis allows direct examination of male germ cells that is not possible with female germ cells so, it is the first step in the investigation of infertility 3 multiple factors are involved in involved in pathogenesis of male infertility [5-9] it may be due to genetic, developmental, hormonal, environmental, STD infection or trauma to the gonads and genital tract through which sperm made, store or transport.

Present retrospective study was conducted to evaluate seminal fluid parameters in our population and to find, type and frequency of abnormal semen parameters based on WHO semen criteria. In infertility clinic commonly patient are visited after one to two years after marriage and failure to conceive child doing unprotected sex. In our study 55 % of patient is between 20-30 age group with mean age of 30 years which is also strongly correlate with study done by Gautam D. *Et al* [10] also this study shows that nearly two third of have the

abnormal semen analysis test. Semen volume less than 1.5 ml was observed in 25.45 % of cases which is greater than similar study done by Gautam D *et al* [9] (8.6%), Bhaduri n *et al* [11] (7.45%) and Prasant Joshi *et al* [12] (6%) less volume due to collection in uncomfortable place, incomplete retrograde ejaculation and androgen defect. normal vitality seen in more than two third of the cases (83.6%) which is correlate with study done by Gautam D *et al* [9] (77.7%)

Sperm concentrations are often proposed to be predictors of fertility potential [13] analysis of retrospective data indicates that sperm counts may have declined in some parts of the world, but there seems to be geographical variations in the semen quality [14-16].

In this study, cases of oligospermia were found 19.2% which is strongly support the result seen in study of Gautam D.*et al* is 19.3% of cases. And other Bhaduri *et al* [10] and Kalakonda M *et al* [17] while the study conducted by Kumar *et al* (34%) [18], contrasts with the present study.

This high percentage might be due to the large sample size. The oligospermic samples had low ejaculated volume, but significantly higher percentage of non-motile sperms and abnormal morphology suggested by Butt et.al [19]. Asthenozoospermia is single abnormality factor found in this study 12.7% agree with the study was done Garg J *et al* [20], Bodal *et al* [21], Ugba *et al* [22] and that reported the prevalence of Asthenozoospermia 14.3%,17%, and 16.5 %respectively and low result seen in study done by Aulia *et al* (5.9%) [23].

The spermatozoa (pm) could be affected by environmental factors, lifestyle, and pollution which explains these differences. Azoospermia may the caused by problem with semen production and blockage of tubal transport seen in 5.5 % of the infertile male similar result seen in study done by Jaitapur *et al* (8.6%).22 present study results lower than the old result seen study done by butt f *et al* (14.8%)16, Bakhtawar gul wazir *et al* (28.6 %) [24].

Other factors which may affect sperm morphology and quality like presence of infection i.e. STD's, environmental factor like labor worker work in hot places or extreme cold places or injury may leads to presence of blood cells in semen or any aglunitationdesease like cystic fibrosis these are the factor which is not cover in this study and may require further research that may help in clear cut effect of these factors on quality of and quantity of semen and help in its treatment

Conclusions

Present study concludes that oligospermia is most common abnormality that causes male infertility after Asthenozoospermia, and routine semen analysis is the still gold standard for detection of male infertility in developing country like India. One main significant factor for male infertility is poor quality of semen.

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