Spectrum of Semen Parameters of Male Partners of Infertile Couples Attending Infertility Clinic

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Abstract:

Introduction: Infertility is a common problem affecting 8-12% of general population. Contrary to popular belief, male factor contributes alone or in association with female factor to 30-50% cases of infertility. Semen analysis is a valuable, cheap, easily accessible diagnostic test which can provide valuable information and pointers towards likely underlying cause of infertility.

Aims and objectives: This study aims to analyse the spectrum of semen parameters of male partners of the infertile couples attending infertility clinic in Jabalpur, Madhya Pradesh.

Materials and methods: Semen parameters of male partner of 285 couples were inserted in master chart and descriptive analysis done.

Results: Male factor alone was responsible in 27.4% couples. Both male female factor was present in 14.5% couples. Mean age of male partner was 35.8± 6.3 yrs. In Isolated male factor couples, 89.29% presented with primary infertility and 10.71% as secondary. In both male/ female factor, 75% presented with primary infertility and 25% as secondary. Normal parameters in 58.1% males. Oligozoospermia in 23.3%, Asthenozoospermia in 34.4% (commonest), Teratozoopermia in 25.3%, oats in 23.3%, Cryptozoopermia in 9.8% and, Azoospermia in 8.8%.

Conclusion: Semen analysis is a useful, cheap, easily accessible test which can identify male factor abnormalities and help prognosticate and decide the best management options for optimal outcomes. Isolated oligospermia is seldom observed, azoopermia needs to be critically checked after centrifuging the sample.

Keywords: Infertility, Male factor infertility, semen parameters, Azoospermia, Oligospermia

Introduction

Infertility is a common problem affecting 8-12% of general population [1]. It is estimated that of the total 60-80 million infertile couples, 15-20 million are from India alone [2]. Contrary to popular belief, male factor contributes alone or in association with female factor to 30-50% cases of infertility [3]. Semen analysis is a valuable, cheap, easily accessible diagnostic test which can provide valuable information and pointers towards likely underlying cause of infertility. Further in case of moderate to severe male factor

which benefit more with ART services, invasive or aggressive female partner evaluation may be avoided.

Aims and objectives

This study aims to analyse the spectrum of semen parameters of male partners of the infertile couples attending infertility clinic in Jabalpur, Madhya Pradesh.

- To determine the mean age male partner

- To identify types and numbers of different seminal parameters in male partner of infertile couple

- To look at age wise distribution of different abnormalities

Materials and methods

Semen analysis of male partners of all couples attending outpatient department of specialty clinic were done following WHO 6th edition instructions. All samples showing azoospermia in pre wash sample were centrifuged and pellet also examined. Semen parameters male partners of 285 couples were recorded in master chart and descriptive analysis done.

Sample size: As per the previous study prevalence of Oligozoospermia in 12%

The sample size was calculated using the following formula (Cochran, 1977):

$$n = \frac{Z_{\alpha/2}^2 pq}{d^2}$$

Where

n = Required minimum sample size

$Z_{\alpha/2}^2$ = 1.96 at 95% confidence Interval

p = prevalence of Oligozoospermia = 12% = 0.12

q = 1- 0.12 = 0.88

d= 4% Absolute Error = 0.04

$n = \frac{(1.96)^2 * 0.12 * 0.88}{(0.04)^2} = 254$ minimum sample

Results

Male factor alone was responsible in 27.4% couples. Both male female factor was present in 14.5% couples. Mean age of male partner was 35.8± 6.3 yrs. In Isolated male factor couples, 89.29% presented with primary infertility and 10.71% as secondary. In both male/ female factor, 75% presented with primary infertility and 25% as secondary. Normal parameters in 58.1% males. Oligozoospermia in 23.3%, Asthenozoospermia in 34.4% (commonest), Teratozoopermia in 25.3%, oats in 23.3%, Cryptozoopermia in 9.8% and, Azoospermia in 8.8%.

In the study group, ovarian factor was contributing in 21.2%, tubal in 16.6%, male factor alone in 27.4%, unexplained in 18.6%, both male- female in 14.5% and others in 1.7%. (Table 1).

Table 1: Distribution of cases according to predominant cause

Cause	Percentage of cases
Ovarian	21.2%
Tubal	16.6%
Male factor	27.4%
Unexplained	18.6%
Both male/ female	14.5%
Others	1.7%

Maximum number of men belonged to age group of 30-34 years (table 2). Mean age of male partner in our study was 35.8 6.3yrs. Almost 20% men were in age group above 40 years too.

Table 2: Distribution of male partners according to age

Age in years	No of patients	%
20-24	7	2.4
25-29	58	20.4
30-34	93	32.6
35-39	70	24.6
40-44	41	14.4
>45	16	5.6
Total	285	100

With reference to the various abnormalities observed, Normal parameters in 58.1% males. Oligozoospermia in 23.3%, Asthenozoospermia in 34.4% (commonest), Teratozoospermia in 25.3%, oats in 23.3%, Cryptozoopermia in 9.8% and, Azoospermia in 8.8%. Unlike in females, where there is decline in ovarian reserve with age, no such age-related pattern was seen in male semen parameters. (Table 3/ chart1).

Table 3: Distribution of different semen parameters according to age

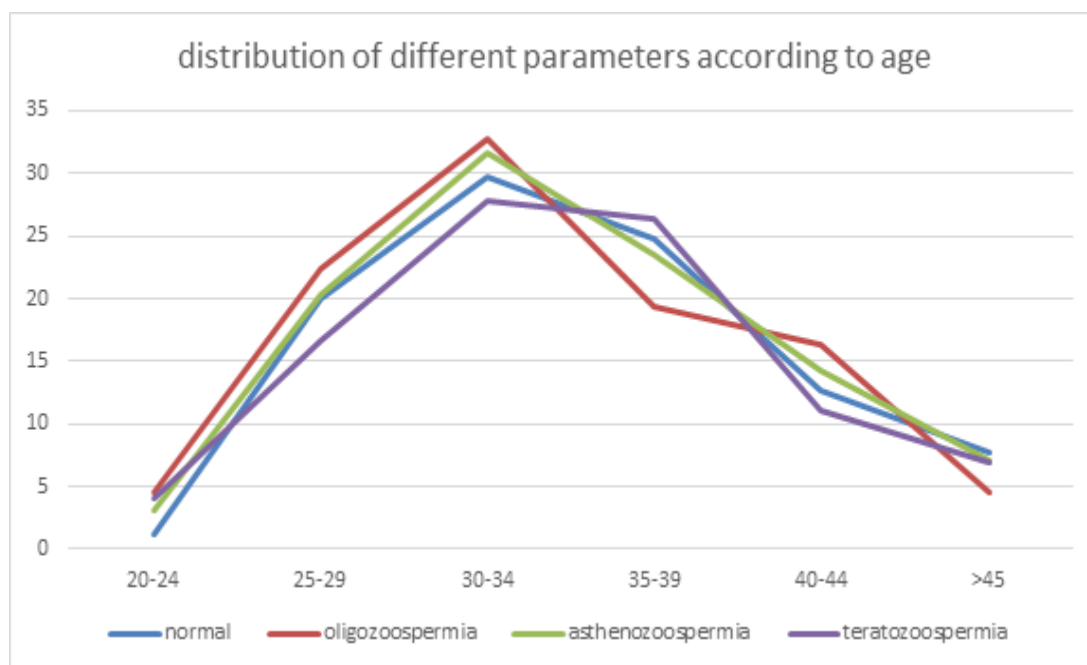| Age in years	Normal %	Oligozoospermia	Asthenozoospermia	Teratozoospermia
20-24	1.2	4.5	3.1	4.1
25-29	20	22.4	20.4	16.7
30-34	29.7	32.8	31.6	27.8
35-39	24.8	19.4	23.5	26.4
40-44	12.7	16.4	14.3	11.1
>45	7.8	4.5	7.1	6.9

Figure 1: Distribution of different parameters according to age

On looking at various major abnormalities with age it was seen that once again the overall pattern of distribution was similar. (Table 4/ chart2). Most patients with cryptozoospermia had general pathology reports with finding suggestive of azoospermia.

Table 4: distribution of major abnormalities according to age

Age in years	Oats	Cryptozoospermia	Azoospermia
20-24	4.5	0	4.5
25-29	22.4	22.7	13.6
30-34	32.8	31.8	45.4
35-39	19.4	22.7	22.7
40-44	16.4	22.7	13.6
>45	4.5	0	0
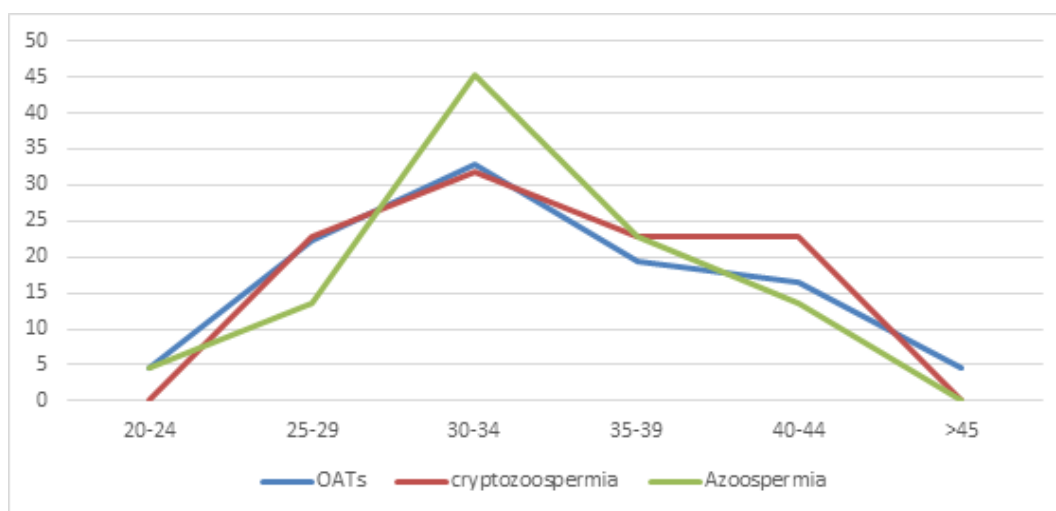
Figure 2: Distribution of major abnormalities according to age

Discussion

Infertility is an emotionally and financially taxing condition for the couple. The stress levels associated with infertility are comparable to those of cancer [4]. Now with introduction of stringent ART act introduced to ensure safe infertility practices, there will be more treatment limitations. Hence it is extremely important to use easily available investigations and treatment modalities widely and judiciously.

The Sixth Edition of the WHO Manual for Human Semen Analysis introduced in 2021 has made the analysis of basic semen parameters more robust, taking into account the criticisms and grey areas of the previous editions. However, most of data that's available on "normal" semen parameters is from certain geographical areas [5].

In this study it was observed that male factor is fairly common and should be evaluated following the WHO manual guidelines. Otherwise finding of cryptozoospermia might be labelled as azoospermia for example. Owolabi AT et al in a study on male partners of infertile couples found oligozoospermia to be commonest abnormality [6]. This study was based on 661 couples.

In another study based on 604 couples by Christian Chigozi Makwe, it was observed that the mean (SD) age of subjects was 42.1 (7.7) years [7]. About three-quarter (73.1%) of the subjects have abnormal semen parameters. The most frequent semen abnormality was asthenozoospermia (55.8%) followed by oligozoospermia (39.4%). [8] Jyoti Garg in their study based on 122 couples concluded that most common abnormality detected was asthenozoospermia (14.3%) followed by oligozoospermia (13.8%), azoospermia (10.5%) and teratozoospermia (10.5%).

Conclusion

Semen analysis is a useful, cheap, easily accessible test which can identify male factor abnormalities and help prognosticate and decide the best management options for optimal outcomes. Isolated oligospermia is seldom observed, azoospermia needs to be critically checked after centrifuging the sample. A lot of attention has been paid to evaluation and management strategies for female factor infertility. Larger studies are needed from Indian subcontinent to understand socio-demographic correlates of male factor infertility as many of them like smoking, varicocele, ROS may be amenable to treatment.

References

1. Katole A, Saoji AV. Prevalence of Primary Infertility and its Associated Risk Factors in Urban Population of Central India: A Community-Based Cross-Sectional Study. Indian J Community Med. 2019 Oct-Dec; 44 (4):337-341.
2. Chander PP, Indira H, Kusum Z. Need and feasibility of providing assisted technologies for infertility management in resource poor settings. ICMR Bull. 2000; 30:55–62.
3. Elussein EA, Magid YM, Omer MM, Adam I. Clinical patterns and major causes of infertility among Sudanese couples. Trop Doct 2008; 38:243-4.
4. Domar AD., Zuttermeister PC., Friedman R. The psychological impact of infertility: a comparison with patients with other medical condition. *J Psychosom Obstet Gynaecol.* 1993;14 (suppl):45–52.
5. Boitrelle F, Shah R, Saleh R, Henkel R, Kandil H, Chung E, Vogiatzi P, Zini A, Arafa M, Agarwal A. The Sixth Edition of the WHO Manual for Human Semen Analysis: A Critical Review and SWOT Analysis. Life (Basel). 2021 Dec 9;11(12):1368.
6. Owolabi A T, Fasubaa O B, Ogunniyi S O. Semen quality of male partners of infertile couples in Ile-Ife, Nigeria. Niger J Clin Pract 2013; 16:37-40
7. MAKWE, Christian Chigozie et al. Seminal fluid parameters of male partners of infertile couples seeking care at the Lagos University Teaching Hospital. International Journal of Reproduction, Contraception, Obstetrics and Gynecology. mar. 2021; 10(4): 1347-1351.
8. GARG, Jyoti et al. Abnormal semen parameters among males in infertile couples: a cross sectional study from a tertiary care centre. International Journal of Reproduction, Contraception, Obstetrics and Gynecology. July 2020; 9(8):3398-3401.