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Research Article

## Study of semen parameters in male partners among infertile couples

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### ABSTRACT

**Background:** The Semen analysis provides valuable information about the etiology and fertility potential of an infertile male. The study was conducted to determine the abnormalities in semen parameters of male partners of infertile couples and to find out contribution of male factors.

**Methods:** The descriptive study with cross sectional design was conducted in the department of Pathology at MIMSR medical college, Latur, Maharashtra, India, between January 2013 to December 2014. A total of 220 cases were analyzed during this period. Semen analysis was performed according to the methods and the standards defined by World Health Organisation (WHO) 5<sup>th</sup> edition 2010.

**Results:** Out of 220 male partners of infertile couples 96 (43.6%) men had abnormal semen parameters. The male factor was responsible in 43.6% of cases. Asthenozoospermia constitutes maximum of 19.9%, followed by Oligozoospermia in 18.6%, Azoospermia in 10.9%, Oligoasthenoteratozoospermia in 7.3% and Oligoasthenozoospermia in 6.8% cases. Leucocytospermia was detected in 15.5% cases.

**Conclusions:** Abnormal semen quality remains a significant contribution to overall infertility. Asthenozoospermia is the most common semen abnormality seen.

**Keywords:** Male infertility, Semen analysis

### INTRODUCTION

The urge and the existential need to procreate is as old as life itself. Infertility is increasingly becoming a source of concern among married couples.<sup>1</sup> Infertility is generally defined as the absence of conception after 12 months of regular, unprotected intercourse, a definition supported by the Practice Committee of the American Society for Reproductive Medicine (ASRM). Older studies have related 20% of cases of infertility to purely male factor etiology, while an additional 30% to 40% involve both male and female factor pathology (Simmons, 1956). Newer studies have shown little change in this distribution with more than 50% attributable to male factor, despite advances in the diagnosis and management of infertility (Mosher and Pratt, 1991; Thonneau et al., 1991)<sup>2</sup> Male infertility is a very devastating problem. It may severely affect the couples psychological harmony,

sexual and social life. Hence determining the possible etiology is very important. Today there are multitude of diagnostic tools available for the evaluation of infertility but the most basic and simple test for evaluation of men remains semen analysis. Semen analysis is relatively inexpensive and can provide valuable information.<sup>3</sup> Semen contains the seminal plasma and the cellular elements. The cellular elements are the spermatozoa, sperm precursors, other cells from genital tract and few leucocytes. Seminal plasma contains the seminal proteins and other biochemical substances produced by the testes and accessory sex glands. Each component of semen has distinctive properties and functions. Semen analysis remains the single most important test in the evaluation of an infertile male.<sup>4</sup> The test gives information regarding seminal characteristics, concentration, motility and morphology.<sup>5</sup> The subfertile male, who has semen parameters lacking in some aspects, should be subjected

to a close scrutiny so as to arrive at a best choice modality for a pregnancy to occur.<sup>1</sup> My aim is to analyze the seminal fluid parameters of the male partners of the infertile couples towards identifying the abnormalities and possible contribution of male factors.

**METHODS**

The descriptive study with cross sectional design was conducted in the department of Pathology at MIMSR medical college, Latur, Maharashtra, India between January 2013 to December 2014.

A total of 220 semen samples were analyzed as per WHO laboratory manual for the examination and processing of human semen. 5<sup>th</sup> edition 2010.<sup>6</sup>

- Study design : Descriptive study with cross sectional design.
- Study population : Male partner of the infertile couples coming to laboratory for semen analysis.
- Inclusion criteria : Infertile couples who were living together for more than one year and had regular unprotected sexual intercourse.
- Exclusion criteria : Men who refused to do semen analysis.
- Duration of abstinence : 2 to 5 days.
- Method of collection : Masturbation, in premises of hospital in a sterile container.
- Macroscopic examination : Liquefaction, colour, appearance, volume, viscosity and PH.
- Biochemical assay  
Fructose : Seliwanoff’s reagent.
- Microscopic examination  
Sperm concentration : Improved Neubauer haemocytometer.
- Motility, agglutination: Wet preparation.
- Vitality: Eosin-Nigrosin stain.
- Morphology: Diff-Quick stain.
- Cellular elements other than sperms : Wet preparation

**RESULTS**

Out of total 220 cases 118 (53.6%) cases were between 26 to 30 years.

**Table 1: Age incidence.**

Sr. No.	Age ( years)	No. of cases	Percentage %
1	Up to 25	32	14.5
2	26 to 30	118	53.6

3	31 to 35	54	24.6
4	36 to40	13	5.9
5	>40	03	1.4
Total		220	100%

Duration of marriage was 1 to 3 years in 132 (60%) of cases.

**Table 2: Duration of married life.**

Sr. No.	Duration of married life in years	No. of cases	Percentage %
1	1 – 3	132	60.0
2	>3 – 6	51	23.2
3	>6 – 9	18	8.2
4	>9 – 12	15	6.8
5	>12	04	1.8
Total		220	100%

For normal sperm concentration lower reference limit was 15 million /ml. Azoospermia was diagnosed when there was absence of spermatozoa in sediment after centrifugation of entire semen sample. Out of 220 male partners of infertile couples, 155 (70.5%) had normal sperm concentration, 41(18.6%) had Oligozoospermia and 24(10.9%) had Azoospermia.

**Table 3: Microscopic examination –sperm concentration.**

Sr. No.	Sperm concentration	No.of cases	Percentage %
1	Normal sperm concentration	155	70.5
2	Oligozoospermia	41	18.6
3	Azoospermia	24	10.9
Total		220	100

In the present study after excluding the cases of azoospermia, motility and morphology study was carried out in 196 cases. Asthenozoospermia was reported in 39 (19.9 %) cases. Teratozoospermia (normal forms < 4 %) was detected in 17 (8.7%) cases.

**Table 4: Microscopic examination –Motility & Morphology.**

Sr. No.	Motility	No. of cases	Percentage %
1	Normal( PR>32% or (PR+NP) >40% )	157	80.1
2	Asthenospermia (PR<32% or	39	19.9

(PR+NP) <40% )			
Total	196	100	
Morphology			
1	Normal sperms	179	91.3
2	Teratozoospermia	17	8.7
Total	196	100	

Leucocytospermia was detected in 34 (15.5%) cases.

Inadequate quantity of semen i.e. less than 1.5 ml was observed in 30 (13.6%) cases. Out of 220 cases, 124 (56.4%) cases were having normal semen parameters and in remaining 96 (43.6%) cases abnormalities in semen parameters were detected.

**Table 5: Distribution of cases on basis of semen parameter defects. N=220**

Sr. No.	Microscopic findings	No. of cases	Percentage %
1	Normozoospermia	124	56.4
2	Normozoospermia with Leucocytospermia	22	10.0
3	Azoospermia	24	10.9
4	Oligoasthenoteratozoospermia	16	7.3
5	Oligoasthenozoospermia	15	6.8
6	Oligozoospermia	10	4.5
7	Asthenozoospermia	08	3.6
8	Teratozoospermia	01	0.5
Total		220	100

Multiple parameter defect was detected in 31 (14.1%) cases, Oligoasthenoteratozoospermia (OAT syndrome) in 7.3% of cases and Oligoasthenospermia in 6.8% of cases. In the present study of 220 infertile couples male factor was responsible in 96 (43.6%) cases as a cause of infertility.

## DISCUSSION

The present study was conducted to assess the pattern and distribution of the abnormal semen parameters in male partners of infertile couples in this area.

Out of 220 males studied 78.2% belonged to an age group of 26 to 35 years which is comparable with the study conducted by Purohit et al.<sup>3</sup> and Joshi et al.<sup>7</sup>

83.2% of couples consulted our infertility clinic within 1 to 6 years of their marriage. Similar findings were observed in study conducted by Abrari et al.<sup>1</sup> and Bodal et al.<sup>8</sup>

Semen volume less than 1.5ml was observed in 13.6% of cases. Bhaduri et al. found 7.45% of cases with less than 1.5 ml<sup>9</sup> where as Jajoo and Kalyani reported 22% of cases with less than 2ml.<sup>10</sup>

Yellowish Colour alteration was seen in 8.6% of cases associated with Leucocytospermia and red brown colour was observed in 0.9% of cases which revealed presence of blood.

PH >8 was found in 9.1% of cases associated with Leucocytospermia.

Azoospermia was reported in 10.9% of cases. Our results agree with studies conducted by Joshi et al.<sup>7</sup>, Bhaduri et al.<sup>9</sup> and Agu et al.<sup>11</sup> who reported 11.0%, 12.42% and 14.2% respectively.

Oligozoospermia was detected in 18.6% of cases. Similar findings were reported in studies conducted by Bodal et al.<sup>8</sup> and Bhaduri et al.<sup>9</sup>

Asthenozoospermia was found in 19.9% of cases Joshi et al. reported 26%<sup>7</sup> while Butt and Akram found Asthenozoospermia in 25.8% cases.<sup>12</sup>

Leucocytospermia was reported in 15.5% of cases which is similar with cases reported by Bhaduri et al 12.42%.<sup>9</sup>

Leucocytospermia reported in 10% of cases as a single parameter abnormality represents essential risk factor that should be treated to improve the quality of semen. Similar observations were reported by Lemkecher et al.<sup>13</sup>

The common multiple factor abnormality in the study population was Oligoasthenoterato zoospermia (OAT syndrome) and Oligoasthenozoospermia.

We found Oligoasthenoterato zoospermia (OAT syndrome) in 7.3% of cases. Butt and Akram reported it 9.09%<sup>12</sup> and Agu et al. reported it in 11.6% cases<sup>11</sup>. Our results are comparable with Butt study.

Oligoasthenozoospermia was reported in 6.8% of cases. Agu et al. reported it in 12.8%.<sup>11</sup> Our percentage is less and the reason might be different geographical areas.

Abnormal results in semen parameters contribute to infertility in males to a greater extent. In present study it was found that the male factor was responsible in 43.6% of cases as a cause of infertility.

Jajoo et al. reported 52% contribution of male factor as a cause of infertility in her study.<sup>10</sup> In present study the percentage is less and the possible reason for this discrepancy might be the lower reference limit for sperm concentration used in her study which was 20 million/ml.

Bodal et al (2014) reported 43 % male factor as a cause of infertility.<sup>8</sup> The results of male factor as a cause of infertility in present study was similar to the study done by Bodal et al.

## CONCLUSIONS

Male factor contributes significant percentage as a cause of infertility. Asthenozoospermia is the most common abnormality detected in present study followed by Oligozoospermia. Genetic studies and other newer studies may highlight various causes of infertility in future.

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