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Research Article

## Male factor in infertility: study from a tertiary care hospital

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### ABSTRACT

**Background:** Infertility is a condition with important psychological, economic, demographic and medical implications. Male infertility refers to a male's inability to result pregnancy in a fertile female.

**Methods:** The present hospital based study was conducted in the Department of Obstetrics and Gynaecology, East Point Hospital, Bangalore. Duration of the study was for 6 months from October 2015 to March 2016. A total of 250 infertile couples couple coming for evaluation to the outpatient department (OPD) were selected in the study by convenient sampling technique. All infertile couples in the study were preliminarily investigated to rule out male factor in infertility. Semen analysis was done as a primary investigation procedure.

**Results:** The overall prevalence of abnormal sperm count in the present study was found to be 34.4%; of which one fourth had oligospermia, 8.4% had Azoospermia and 1.2% had asthenozoospermia. Study found a significant association between type of occupation, obesity and alcohol addiction with abnormal sperm count.

**Conclusions:** High prevalence of male factor in infertility was noted in the present study. Refraining from addictions, certain life style changes including exercise and timely medical attention can address the issue.

**Keywords:** Infertility, Male factor, Semen analysis, Sperm count, Occupation

### INTRODUCTION

Infertility is a condition with important psychological, economic, demographic and medical implications. The consequences of infertility are manifold and can include societal repercussions and personal suffering. Partners may become more anxious to conceive, increasing sexual dysfunction.

Infertility is "a disease of the reproductive system defined by the failure to achieve a clinical pregnancy after 12 months or more of regular unprotected sexual intercourse.<sup>1</sup> It can also be defined as failure of a couple to conceive after 12 months of regular intercourse without use of contraception in women less than 35 years of age; and after 6 months of regular intercourse without use of contraception in women 35 years and older.<sup>2</sup>

Infertility could be primary or secondary infertility. Primary infertility is infertility in a couple who have

never had a child. Secondary infertility is failure to conceive following a previous pregnancy.

The World Health Organization (WHO) estimates that 60–80 million couples worldwide currently suffer from infertility.<sup>3</sup> Infertility varies across regions of the world and is estimated to affect 8–12% of couples worldwide.<sup>4,5</sup> The WHO estimates the overall prevalence of primary infertility in India to be between 3.9% and 16.8%.<sup>3</sup>

Male infertility refers to a male's inability to result pregnancy in a fertile female. "Male factor" infertility is seen as an alteration in sperm concentration and/or motility and/ or morphology in at least one sample of two sperm analyses collected 1 and 4 weeks apart.<sup>6</sup>

The causes of male infertility can be divided into four main areas:

1. Hypothalamic-pituitary disease
2. Testicular disease

3. Disorders of sperm transport
4. Idiopathic

A semen analysis is the corner stone of the assessment of the male partner of an infertile couple. The following are the WHO lower reference limits for semen analysis.<sup>7</sup>

Volume, 1.5 mL; sperm concentration, 15 million spermatozoa/mL; total sperm number, 39 million spermatozoa per ejaculate; morphology, 4% normal forms; vitality, 58% live; progressive motility, 32%, total (progressive + non-progressive motility), 40%.

Other investigations done for an infertile man are endocrine assessment which includes measurements of serum testosterone, luteinizing hormone and follicle stimulating hormone.

The present study has been with a primary objective to determine the male factor in infertility.

## METHODS

A hospital based study was conducted in the Department of Obstetrics and Gynaecology, East Point Hospital, Bangalore, Karnataka, India during period for 6 months from October 2015 to March 2016.

Study participants were infertile couples coming for evaluation to the outpatient department (OPD).

*Sample size:* A total of 250 infertile couples were selected in the study by convenient sampling technique.

All infertile couples in the study were preliminarily investigated to rule out male factor in infertility. A predesigned proforma was used to get demographic details from men such as age, education, occupation, family history, details regards to tobacco, smoking & alcohol. Measurement of weight and height was done to get Body mass index (BMI) and physical examination was done.

Semen analysis was done as a primary investigation procedure. Prior to the semen analysis, proper instruction were given with regards to period of abstinence from sex and other details.

Informed verbal consent was taken from the subjects and confidentiality was ensured.

### Statistical analysis

Data entry and analysis was done using the EPI INFO version 7. Data was presented in percentages and proportions. Univariate analysis was done using chi square test with 95% level of significance (p<0.05 considered statistical significant).

## RESULTS

**Table 1: Distribution of cases according to semen analysis report.**

Sperm count	Number	Percentage
Normozoospermia	164	65.6%
Oligospermia	62	24.8%
Azoospermia	21	8.4%
Asthenozoospermia	03	1.2%
Total	250	100%

**Table 2: Association of demographic factors with abnormal sperm count.**

Demographic factor	Sperm count		p value**
	Normal count (164)	Abnormal count* (86)	
<b>Education</b>			
Illiterate	21	15	0.3
Literate	143	71	
<b>Occupation</b>			
Professional and semi prof.	75	58	0.001**
Skilled, semiskilled and Unskilled	89	28	
<b>Obesity</b>			
Normal	98	31	0.0003**
Overweight and Obese	66	55	
<b>Smoking</b>			
Yes	46	27	0.5
No	118	59	
<b>Alcohol</b>			
Yes	74	55	0.004**
No	90	31	
<b>Tobacco</b>			
Yes	35	23	0.3
No	129	63	

\*Abnormal count includes Oligospermia, Azoospermia and Asthenozoospermia; \*\*p <0.05 considered statistically significant.

### Demographic characteristics

Mean age of the men in the study was 28.4±4.5 years with majority (54%) in the age group of 25-35 years age group. Almost three fourth were Hindus by religion and belonged to backward caste (OBC). Majority of the study population (85%) were literates and about 15% (36) were illiterates. More than half percent (53.2%) were in professional, semiprofessional occupation.

The mean duration of marital life was 3.7±2.5 years and majority (73.5%) consulted due to primary infertility and rest (26.5%) due to secondary infertility.

**Addictions:** Addictions such as smoking, alcohol, tobacco chewing history was assessed using & defined as per standard WHO criteria Among the total study population (n=250), about 30% (73) were currently smokers, 51.6% (129) were alcoholics and 23.2% (58) were tobacco chewers.

**Obesity:** Body mass index (BMI) was calculated. Study found that almost half the proportions (121) were overweight and obese.

### **Semen analysis findings**

Total 250 men underwent semen analysis. The findings revealed that 65.6% (164) had normozoospermia (normal sperm count), one fourth (62) had oligospermia (low sperm count), 8.4% (21) had Azoospermia (absence of sperms) and 1.2% (3) had asthenozoospermia (reduced sperm motility). Total 34.4% (86) had abnormal sperm count. (Table 1)

### **Association between demographic and other factors and abnormal semen report**

Associated between various factors (demographic, addictions and obesity) and sperm count was assessed. Study found a significant association between type of occupation and abnormal sperm count ( $p=0.001$ ). Present study also found a significant association between obesity and abnormal sperm count ( $p=0.0003$ ). Other demographic factors such as education, age did not had a significant association ( $p>0.05$ ) (Table 2).

Alcohol addiction had significant association with abnormal sperm count ( $p=0.004$ ).

Other addictions such as smoking, tobacco chewing did not had significant association ( $p>0.05$ ) (Table 2).

## **DISCUSSION**

Due to the lifestyle changes, the growing concern on male infertility is on the rise globally and in India. Present hospital based study done to determine this aspect among infertile couples had the following findings.

### **Semen analysis**

The overall prevalence of abnormal sperm count in the present study was found to be 34.4%; of which one fourth had oligospermia, 8.4% had Azoospermia and 1.2% had asthenozoospermia.

Similar kind of results were seen in a retrospective study by Kumar N et al, where Oligozoospermia was found in 1053 (34.14%), Asthenozoospermia in 597 (19.35%) and Azoospermia in 330 (10.70%).<sup>8</sup> Study by Butt F and Akram N observed azoospermia in 59 (14.89%), and oligospermia in 44 (11.11%).<sup>9</sup>

Another study by Mittal A et al found that male factor was responsible in 17.95% of primary infertility and 14.9% in secondary infertility.<sup>10</sup>

### **Association between demographic and other factors and abnormal semen report**

**Occupation:** Present study found a significant association between type of occupation and abnormal sperm count ( $p=0.001$ ) indicating that men from professional and semi-professional occupation had abnormal sperm count compared to other kinds of occupation such as skilled, semi-skilled and unskilled labourers. The probable reason for this might be the lifestyle changes attributed to the occupation and the work related stress.

In contrast to the above findings, study by Samal S et al on epidemiological study on male infertility found that farm workers or labourers constituted 1950 (65.00%) cases, 870 (29.00%) were factory workers (mainly working in Coalmines) and 180 (6.00%) were involved in sedentary job.<sup>11</sup> The reason for this variation could be attributed to the study area; Samal S et al study was done from a rural area where majority might be from semi-skilled and unskilled type of occupation.<sup>11</sup>

**Addictions:** Alcohol addiction had significant association with abnormal sperm count ( $p=0.004$ ) which reiterates the fact that excessive alcohol consumption associated with poor reproductive function including ejaculatory dysfunction. Other addictions such as smoking, tobacco chewing did not had significant association ( $p>0.05$ ).

Similar results were obtained in study by Samal S et al, where the abnormalities of semen were 35.49%, 86.49% and 53.75% in smokers, alcoholics and in cases having more than one addiction respectively.<sup>11</sup> Alcoholics had statistically significant abnormal semen analysis report while in smokers the abnormality of semen compared to normozoospermia was statistically significant.

Another study by Kalyani R et al on factors influencing quality of semen found that reduction of sperm density was statistically significant ( $p$  value  $<0.05$ ) in both tobacco users and alcoholic.<sup>12</sup>

**Obesity:** Obesity is a major health issue and the relationship between obesity and male infertility has been described recently in many reports.<sup>13,14</sup> Excess weight has been reported to increase the risk of reproductive problems. Total body fat, intra-abdominal fat, and subcutaneous fat have all been associated with low levels of total and free testosterone.<sup>15</sup> Present study found a significant association between obesity and abnormal sperm count ( $p=0.0003$ ).

In contrast to the above findings, study by Sharath Kumar C et al did not found a significant relation between increased BMI and negative changes in their semen parameters in infertile couples.<sup>15</sup>

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