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Original Research Article

Diagnostic utility of semen analysis in infertile couples: a prospective study

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ABSTRACT

Background: Infertility is defined as a failure to conceive after at least 12 months of unprotected intercourse. It is broadly established that 40% cases of infertility has male factor. Semen analyses is an imperative diagnostic tool in the valuation of the male partners of infertile couples.

Methods: We carried out a prospective study wherein semen analyses of the male partners of infertile couples presented to Department of Pathology, Government Medical College and Associate Hospital, Jammu was done. A total of 300 cases were studied and comparison of each abnormality and combined defects were subjected to incidence distribution.

Results: We analysed 300 samples in this study. Mean age of the men was 32.5 years. Duration of infertility in (200; 66.6%) was seen in men married for less than 5 years, (84; 28%) between 5-10 years of married life and there were (16; 5.3%) with more than 10 years of infertility period after marriage. Addiction to alcohol made the majority in our study (187; 62.3%), followed by tobacco chewing and addiction to both tobacco chewing and alcohol consumption (89; 29.6%) and (24; 8%), respectively, men were amongst those with abnormal seminograms.

Conclusions: Male infertility is an alarming global health issue. Males contribute towards infertility in couples significantly and further study and assessment is required to accurately predict the importance of this.

Keywords: Infertility, Motility, Morphology, Semen, Sperm count

INTRODUCTION

Infertility is a condition with social, economical, psychological and medical impact resulting in stress, particularly in a social framework like ours, which has a strong accent on child-bearing.¹ Infertility is defined as a failure to conceive after at least 12 months of unprotected intercourse.²

Leeuwenhoek in 1677, examined his own ejaculate, under the microscope which revealed presence of living human sperm cells in a drop of semen for the first time. It is broadly established that 40% cases of infertility has

male factor and female factor contributes to another 40% of the cases. Only in 20% cases, there is combined male and female factor. In India, the prevalence of primary infertility is estimated to be 10-20%.³ A semen analysis is an imperative diagnostic tool in the valuation of the male partners of infertile couples. Detailed and careful evaluation of the ejaculate parameters may suggest the likely causes of infertility and their identification could help to institute appropriate treatment, if accessible.³ We conducted this study to find out contribution of the seminal patterns towards overall infertility due to male factors in our setting. And assess the different seminal patterns in male infertility.

METHODS

We carried out a prospective study wherein semen analyses of the male partners of infertile couples presented to Department of Pathology, Government Medical College and Associate Hospital, Jammu was done. A total of 300 consecutive cases were taken for the study excluding patients with previous history of disease such as varicocele, cryptorchidism, epididymitis, mumps, azoospermia or surgery associated with reproductive function like vasectomy and vasectomy reversal. Detailed history was taken which included their job profile, alcohol consumption, smoking habits and medical and family history. Semen collection was done in sterile plastic containers by masturbation after 3 days of abstinence. Samples were delivered within one hour of collection and analysed by manual method. Physical and microscopic examination for volume, viscosity, sperm concentration, motility and morphology, according to WHO guidelines on semen analysis was done. A comparison of each abnormality and combined defects were subjected to incidence distribution.

Statistical analysis

For data analysis, we used Statistical Package for the Social Sciences (SPSS) version 10. Age and morphological patterns were expressed as frequency and percentage.

RESULTS

We analysed 300 samples in this prospective study. Mean age of the men in this study was 32.5 years Figure 1.

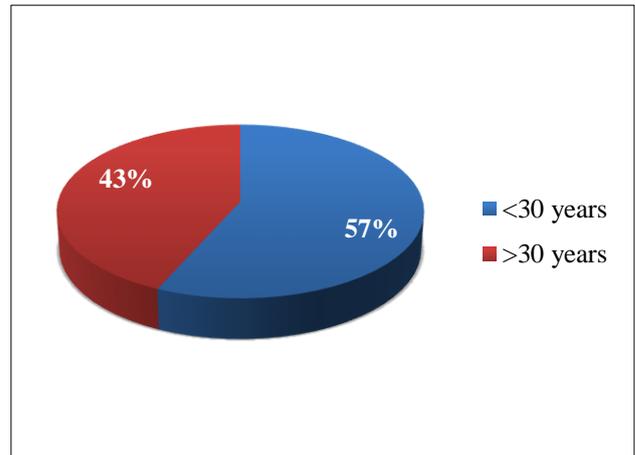


Figure 1: Number of cases according to age.

Duration of infertility in (200; 66.6%) was seen in men married for less than 5 years, (84; 28%) between 5-10 years of married life and there were (16; 5.3%) with more than 10 years of infertility period after marriage. Seminogram is tabulated in Table 1.

Table 1: Detailed seminogram of all patients.

Parameters	No. of cases	%	
Volume (in ml)	<2	90	30
	2-4	190	63.3
	4-6	20	6.6
Sperm count (million/ml)	<20	180	60
	20-40	105	35
	>60	15	5
Proportion of motility (per hpf)	<25	198	66
	25-50	78	26
	50-75	19	6.3
	75-100	5	1.6
Morphology	Normal	95	31.6
	Abnormal	205	68.3
Pus cells	Present	110	36.6
	Absent	190	63.3

Addiction to alcohol made the majority in our study (187; 62.3%), followed by tobacco chewing and addiction to both tobacco chewing and alcohol consumption (89; 29.6%) and (24; 8%), respectively, men were amongst those with abnormal seminograms Figure 2.

There are very few studies in rural areas as far as male infertility is concerned. Sperm count, motility and morphological abnormality are the parameters discussed in reference to different factors in this study. Majority had abnormality in sperm motility Table 2.

Table 2: Depicting semen abnormality in different factors studied.

Factors		Abnormal sperm count	Abnormal motility	Abnormal morphology	Total
Age	<30 years	50	100	20	170
	>30 years	26	94	10	130
Period of infertility	<5 years	50	92	58	200
	5-10 years	10	52	22	84
	>10 years	9	5	2	16
Addiction	Alcohol	120	37	30	187
	Tobacco	59	14	14	89
	Both	6	16	16	24

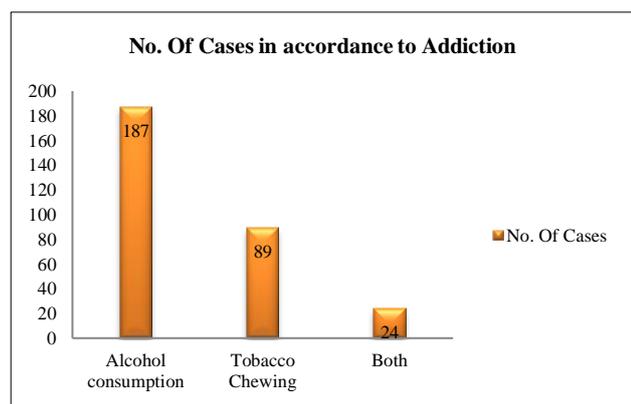


Figure 2: Number of cases in accordance to addiction.

DISCUSSION

The present study was conducted on 300 abnormal semen samples to discover the abnormalities in the samples for detection of the infertility in males. A very few studies has been conducted as far as male infertility is concerned. Semen analysis plays a vital role in the diagnosis of infertility, as it is a cost effective diagnostic tool in the valuation of the male partners of infertile couples.

The parameter considered in this study includes semen count, motility and morphology. Majority showed abnormality in sperm motility.

Mean age of the men in this study was 32.5 years. A prominent number i.e. 66.6% had duration of infertility below 5 years, 28% between 5-10 years and there were only 5.3% with more than 10 years of infertility; paralleled to studies by Jajoo et al, and Jain A et al who found 62% and 66% had duration of infertility below 5 years, respectively.^{1,3}

In the present study as far as semen volume is concerned, 30% males had <2 ml, 63.3% had 2-4 ml and 20% had 4-6ml. Studies conducted in Bangalore by Joshi et al showed 6% cases had semen volume of less than 2 ml, rural central Indian study by Jajoo et al and western Indian study by Jain A et al revealed that 22% and 28% of cases had semen volume of less than 2 ml,

respectively.^{1,3,4} An international study by Onyeka CA et al stated 33.8% males had semen volume less than normal in Nigeria.⁵

In our study sperm count of 60% men was less than 20 million/ml which was comparable to study done by Jain A et al but disagreement was noted with Jajoo et al which revealed 25% men with less than 20 million/ml sperm count.^{1,3}

In comparison of sperm concentration and motility; motility has a strong correlation to percentage of pregnancy and conception rate. In our study, 92% samples showed less than 50% motile sperms/hpf which was comparable to study done by Jain A et al in western India.¹

A high number of cases showed abnormal forms in our study comprising of 68.3% which was in agreement to studies done by Jain A et al, and Jajoo et al, in western India and rural central India, respectively.^{1,3}

In present study, 36.6% men had presence of pus cells in semen samples, which was in contrast to study conducted in West Bengal by Bhaduri (Bhattacharyya) N et al.⁶

In our study, 62.3% men had semen abnormality were addicted to alcohol, followed by 29.6% men with addiction to tobacco chewing and only 8% men were addicted to both tobacco and alcohol. Our study was in agreement with study done by Samal et al, having maximum cases with alcohol addiction but in contrast to study by Jajoo et al, which revealed majority with tobacco addiction.^{3,7} Chronic alcohol intake may result in male infertility by decreasing sperm volume, count, motility and also affecting the morphology.⁸⁻¹⁰

Social factors like smoking, environmental conditions, and genetics are also questioned to contribute to the variation in different studies.¹¹

Male infertility is an alarming global health issue that has not been researched or studied to truly understand its magnitude and prevalence.¹² Males contribute towards infertility in couples significantly and further study and

assessment is required to accurately predict the importance of this. And the extent to which males contribute to infertility is yet to be studied and requires more elaborate research.

CONCLUSION

Unlike female infertility, male infertility is under reported in developing countries like ours, so it's difficult to investigate exact cause and number. But in future, we can expect to conduct more research studies and contribute to find out the general causes of male infertility and can work in that direction to reduce such factors which can affect the fertility of males. There is still a great scope for further research into underlying etiology and treatment of male infertility.

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