Research Article

Role of semen analysis in the diagnosis of infertility at a tertiary care centre in Western India: a prospective study

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ABSTRACT

Background: The prevalence of infertility in the general population is 15%-20%. Of this, the male factor is responsible for 20%-40%. In Indian couples seeking treatment, the male factor is the cause in approximately 23%. Semen analysis is an indispensable diagnostic tool in the evaluation of the male partners of infertile couples. Careful evaluation of the ejaculate parameters may suggest the possible causes of infertility and their identification could help to institute appropriate therapy, if available.
Methods: Semen samples were analyzed by manual method. An analysis for volume, viscosity, sperm concentration, motility, and morphology, according to WHO guidelines on semen analysis was done.
Results: This study, done at a tertiary care center at Western India, at M.G.M hospital has demonstrated that abnormal semen quality is a major factor contributing to infertility in couples.28% males had volume <2 ml, 70% had sperm count <20 million/ml and 72% had sperms with abnormal morphology.
Conclusions: Semen analysis remains a significant contribution in the overall diagnosis of infertility in our environment and semen analysis is an indispensable diagnostic tool in the evaluation of the male partners of infertile couples. Males contribute towards infertility in couples significantly and further study and assessment is required to accurately predict the importance of this.

Keywords: Male infertility, Semen, India

INTRODUCTION

A firm evidence of the contribution of the sperm to reproduction came when Leeuwenhoek in 1677, while examining his own ejaculate, under the microscope saw living human sperm cells in a drop of semen for the first time.[1] Infertility is a condition with psychological, economic, medical implications resulting in trauma, stress, particularly in a social set-up like ours, with a strong emphasis on child-bearing. According to the international committee for monitoring assisted reproductive technology, WHO, infertility is a disease of reproductive system defined by failure to achieve the clinical pregnancy after 12 months or more of regular unprotected sexual intercourse.[2]

It can also be defined as failure of couple to conceive after 12 months of regular intercourse without the use of contraception in women <35 years; and after 6 months of regular intercourse without the use of contraception in women ≥35 years.[3]

The prevalence of infertility in the general population is 15%-20%. Of this, the male factor is responsible for 20%-40%.[4] In Indian couples seeking treatment, the male factor is the cause in approximately 23%.[5] Semen analyses is an indispensable diagnostic tool in the evaluation of the male partners of infertile couples. Careful evaluation of the ejaculate parameters may suggest the possible causes of infertility and their

identification could help to institute appropriate therapy, if available.[6]

The objective of this study was to evaluate contribution of the seminal patterns towards overall infertility due to male factors in our environment. And assess the different seminal patterns in male infertility.

METHODS

It was a prospective study wherein semen analyses of the male partners of infertile couples who presented at M.G.M Hospital and medical college, Navi Mumbai, Maharashtra, India was done between January 2015 to May 2016. Semen collection was done at the hospital in sterile plastic containers by masturbation after 3 days of abstinence. Samples were delivered within one hour of collection and analyzed by manual method. Analyses were done for volume, viscosity, sperm concentration, motility, and morphology, according to WHO guidelines on semen analysis.

A total of 109 cases were studied and proportion of each abnormality and observed combined defects were subjected to frequency distribution.

RESULTS

A total of 109 samples were analysed out of which 50 (45.9 %) were abnormal. These abnormal samples were further analysed.

Mean age of the men in this study was 29.24 years. Majority i.e., 66% had duration of infertility below 5 years, 20% between 5-10 years and there were 7 (14%) with more than 10 years of infertility.

Table 1: Baseline characteristics of study subjects with abnormal semen analysis.

Characteristics	Number	Percentage
Age in years		
< 30	25	50
> 30	25	50
Duration of infertility in years		
< 5	33	66
5-10	10	20
>10	7	14

Amongst the men who had abnormal semen analysis, 50% were below 30 years of age and 50% were above 30 years of age.

As far as semen volume is concerned, 28% males had volume <2 ml, 70% had volume between 2-4 ml and only 1 (2%) had volume between 4-6 ml.

70% had sperm count <20 million. In our study, 94% patients had <50% motile sperms/hpf out of which 46% had <25% motile sperms.

28% had normal morphology and 72% had abnormal morphology. Among the patients having abnormal forms of sperms present 22.22% had <5% abnormal forms, 44.45% had 5-10% abnormal forms and 33.33% had > 10% abnormal forms.

Pus cells present in all of the 50 patients with abnormal seminogram.

Table 2: Patterns of semen analysis among the study subjects with abnormal semen analysis.

Characteristics	Number	Percentage
Volume in ml		
<2	14	28
2-4	35	70
4-6	1	2
Sperm count in million/ml		
<20	35	70
20-40	13	26
>60	2	4
Proportion of motile sperms in percentage		
< 25	23	46
25-50	24	48
50-75	3	6
75-100	-	-
Abnormal forms		
Present	36	72
Absent	14	28
Abnormal forms in percent		
< 5	8	22.22
5-10	16	44.45
>10	12	33.33
Pus cells		
Present	50	100
Absent	-	-

DISCUSSION

The present study was conducted to determine the abnormalities in semen samples for detection of male infertility. There are very few studies in rural areas as far as infertility is concerned. Semen motility, morphology and volume abnormality are the parameters discussed in this study. Most common abnormality encountered was abnormality in sperm motility. Mean age of the men in this study was 29.24 years. Majority i.e. 66% had duration of infertility below 5 years, 20 % between 5-10 years and there were 7 (14%) with more than 10 years of infertility as compared to a study by Jajoo et al who found 62% had duration of infertility below 5 years, 32% between 5-10 years and there were 6 (6%) with more than 10 years of infertility.[4]

As far as semen volume is concerned, 28% males had volume <2 ml, 70% had volume between 2-4 ml and only 1 (2%) had volume between 4-6 ml. According to a study by Mohammad et al on infertile Sudanese males in Gerzia state, 89.7% had normal semen volume.[7] In a study at Bangalore by Joshi et al 6% cases had semen volume of less than 2 ml.[8] A study conducted at rural central India revealed that 22% of cases had semen volume of less than 2 ml.[9] 33.8% males had semen volume less than normal in Nigeria study.[10]

70% had sperm count <20 million/ml (as compared to 44% in Gerzia study, and 25 % in Jajoo et al. study). In our study, 94 % patients had <50% motile sperms/hpf, out of which 46% had <25% motile sperms. Of the primary parameters of semen analysis, motility has a much stronger relationship to both percentage of pregnancy and conception rate when compared to sperm concentration.

28% had normal morphology and 72% had abnormal morphology. Our results agree with Atken et al, Mcleod et al and Larry and Stunct that semen of infertile males carry a higher percentage of abnormal forms.

Semen abnormalities is equally distributed in both age groups i.e. <30 years and >30 years.

CONCLUSION

Semen analysis remains a significant contribution in the overall diagnosis of infertility in our environment and semen analysis is an indispensable diagnostic tool in the evaluation of the male partners of infertile couples. Males contribute towards infertility in couples significantly and further study and assessment is required to accurately predict the importance of this.

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REFERENCES

1. Malik S, Agrawal A. Understanding male infertility, Evolution of male infertility. 2012:1-7.
2. Zegers-Hochschild F, Adamson GD, de Mouzon J, Ishihara O, Mansour R, Nygren K, et al. International committee for monitoring assisted reproductive technology (ICMART) and the world health organization (WHO) revised glossary of ART terminology. Fertil Steril. 2009;92:1520-4.
3. Practice Committee of the American Society for Reproductive Medicine. Definitions of infertility and recurrent pregnancy loss. Fertil Steril. 2008;90(5 Suppl):S60.
4. Sigman M, Lipshultz LI, Howards SS. Evaluation of the subfertile male. In: Lipshultz LI, Howards SS eds. Infertility in the Male. 4th ed. St. Louis, Missouri: Mosby-Year Book; 1997:173.
5. Zargar AH, Wani AI, Masoodi SR, Laway BA, Salahuddin M. Epidemiologic and etiologic aspects of primary infertility in the Kashmir region of India. Fertil Steril. 1997;68:637-43.
6. Jajoo S, Kalyani KR. Prevalence of abnormal semen analysis in patients of infertility at a rural setup in Central India, International Journal of Reproduction, Contraception, Obstetrics and Gynecolog. 2013;2(2):161-4.
7. Adeiji RA, Olayemi O, Okunlola A, Aimakhu CO. Pattern of semen analysis of male patners of infertile couples at the University College Hospital, Ibadan. West Afr J Med. 2003;22:243-5.
8. Joshi P, Gopal N, Bhat V. Study of semen analysis patterns in infertile males. Int J Pharm Bio Sci. 2011;1(1):44-9.
9. Jajoo S, Kalyani KR. Prevalence of abnormal semen analysis in patients of infertility at a rural setup in Central India. Int J Reprod Contracept Obstet Gynecol. 2013;2(2):161-4.
10. Onyeka CA, Ashiru OA, Duru FI, Olorunfemi OJ, Fabunmi OO, Oluwatuyi TS. Semen analysis of 263 sample men from infertility clinic in western Nigeria. West Afr J Assist Reprod. 2012;2(1):1-16.