Prevalence, Clinical Patterns and Epidemiology of Male Factors in Infertility among Patients Coming to a Tertiary Care Hospital

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Abstract: *Infertility affects 8-12% of couples worldwide. Of all infertility cases, approximately 20-25% is due to male factor infertility. Methods: A randomized prospective observational study was conducted in the Department of Obstetrics and Gynaecology, S.M.G.S. Hospital, Jammu from October 2017 to September 2018 after getting approval from ethical committee. 240 patients coming to OPD or admitted in Gynaecology wards for infertility work up were included in this study. Informed consent, thorough history of male partner and semen samples were taken. Results: Out of 240 patients enrolled for infertility 180 patients (75%) had normal semen analysis. Only 60 patients (25%) had one or more abnormal parameter of semen analysis. More than one parameter was abnormal in 14(5.83%) patients. Out of 60 patients with abnormal semen parameters, 26.67% (16) patients were smokers, 18.33% (11) patients were alcoholic, 8.33% (5) were tobacco consumers and 55% (33) patients were non addicted. Conclusion: Male infertility is an important cause of infertility with a strong impact on the psychology and physiology of couple. The contribution of male factor in infertility is high and many of the cases still remain idiopathic.*

Keywords: Male infertility, semen analysis, infertility

1. Introduction

Infertility and problems of impaired fecundity have been a concern through ages and is also a significant clinical problem today, which affects 8-12% of couples worldwide. As many as 2% of all men will exhibit suboptimal sperm parameters (Kumar N et al., 2016) [1]. It may be one or a combination of low sperm concentration, poor sperm motility, or abnormal morphology.

2. Literature Survey

The rates of infertility in less industrialized nations are markedly higher and infectious diseases are responsible for a greater proportion of infertility. Even though curtailing population growth is a major national concern, meanwhile substantial number of infertile couples in India is of equal concern (Seshagiriet al., 2001) [2]. Male reproductive function in the general population has gained more attention due to the occurrence of several biological problems affecting the male genital tract and has increased during the last 50 years (Toppariet al., 1996)[3]. It is important to identify the cause of infertility so that appropriate treatment can be given.

3. Material and Methods

This was a randomized prospective observational study conducted in the Post Graduate Department of Obstetrics and Gynaecology, S.M.G.S. Hospital, Jammu over a period of one year i.e. October 2017 to September 2018 after getting approval from ethical committee.

240 patients coming to OPD on Mondays, Wednesdays and Fridays or admitted in Gynaecology wards for infertility work up (both primary and secondary) were included. An informed consent and a thorough history of male partner was taken to know about causal factors, contributing factors of infertility and its clinical patterns.

Semen samples obtained by masturbation after 3-5 days of abstinence and analysed as per WHO 2010 criteria in department of pathology by manual method. Semen analysis (WHO Standards 2010 5th edition) [4]

Parameter	Lower reference limit(range)
Semen volume(ml)	1.5(1.4-1.7)
Total sperm number(million/ejaculate)	39(33-46)
Sperm concentration(million/ml)	15(12-16)
Total motility	40(38-42)
Progressive motility (%)	32(31-34)
Vitality (live sperms%)	58(55-63)
Sperm morphology (%)	4(3-4)
pH	>7.2
Peroxidase positive leucocytes (million/ml)	<1.0

The patients who came with abnormal semen reports from any laboratory, the results were reconfirmed by repeating their semen analysis in S.M.G.S. hospital done under the department of Pathology.

In patients with no positive history and normal semen analysis male factor of known cause was ruled out. If a patient was having some abnormal factor in semen analysis, a repeat semen analysis was done after 6 weeks and if that too was abnormal, urologist consultation was sought.

At the end of the study data was compiled and analysed by appropriate statistical tests.

4. Results

Out of 240 patients enrolled in the study, maximum number of females 97 (40.42%) belonged to the age group of 26-30 years with the mean age of 27.08+_4.24years ranging from 19 to 40 years (Table 1).

However, maximum number of males i.e. 109 (45.42%) belonged to the age group of 26-30 years with the mean age of 30.51+_5.04years (Table 2).

In our study 67.92% (163) patients were having primary infertility and 32.08 % (77) patients had secondary infertility (Table 3).

Maximum patients i.e. 126 (52.50%) belonged to rural areas as compared to urban areas 114 patients (47.50%) (Table 4).

Education level of majority of the patients i.e. 134 (55.83%) was from 10th to 12th standard followed by above 12th standard, 66 patients (27.5%) (Table 5).

Majority of the patients (112 /46.6%) belonged to middle class socioeconomic status according to B.G. Prasad scale followed by upper class i.e. (43/17.92%) (Table 6).

Mean duration of infertility was 4.93+_3.14 years with a range of 1 to 19 years. Maximum number of patients (116 / 48.33%) had duration of infertility between 2-4years. (Table 7).

Out of 240 patients enrolled for infertility 180 patients (75%) had normal semen analysis. Only 60 patients (25%) had one or more abnormal parameter of semen analysis (Table 8). More than one parameter was abnormal in 14(5.83%) patients. Abnormal colour was present only in 2 (3.33%) patients, abnormal volume in 16.67% (10) patients, abnormal liquefaction time in 25% (15) patients, abnormal pH was seen in 20% (12) patients, abnormal count was present in 45% (27) patients, abnormal concentration in 20% (12) patients, progressive motility was abnormal in 38.33% (23) patients and morphology was abnormal in 6.67% (4) patients (Table 9).

Table 1: Age distribution in females:

Age group (in years)	Number (No.)	Percentage (%)
≤20	8	3.33
21 – 25	95	39.58
26 – 30	97	40.42
31 – 35	28	11.67
>35	12	5.00
Total	240	100.00

Table 2: Age distribution in males:

Age group (in years)	Number (No.)	Percentage (%)
≤20	1	0.42
21 – 25	31	12.92
26 – 30	109	45.42
31 – 35	68	28.33
>35	31	12.92
Total	240	100.00

Table 3: Type of infertility:

Type of infertility	Number (No.)	Percentage (%)
Primary	163	67.92
Secondary	77	32.08
Total	240	100.00

Table 4: Residence

Place of residence	Number (No.)	Percentage (%)
Urban	114	47.50
Rural	126	52.50
Total	240	100.00

Table 5: Educational status

Education status	Number (No.)	Percentage (%)
Illiterate	7	2.92
Below 10th standard	33	13.75
10th – 12th standard	134	55.83
Above 12th standard	66	27.50
Total	240	100.00

Table 6: Socioeconomic status

Socioeconomic status	Number (No.)	Percentage (%)
Lower class	17	7.08
Lower-middle class	34	14.17
Middle class	112	46.66
Upper-middle class	34	14.17
Upper class	43	17.92
Total	240	100.00

*B.G. Prasad scale.

Table 7: Duration of infertility

Duration of infertility (in years)	Number (No.)	Percentage (%)
<2	17	7.08
2 – 4	116	48.33
4 – 6	58	24.17
>6	49	20.42
Total	240	100.00

Table 8: Semen Analysis

Semen analysis	Number	Percentage (%) with 95% CI
Normal	180	75.00 (69.16 - 80.06)
Abnormal	60	25.00 (19.9 – 30.8)
Total	240	100.00

*CI- Confidence Interval.

Table 9: Abnormal semen analysis (n=60)

Semen parameters	Abnormal (No.)	Percentage (%) with 95% CI
Colour	2	3.33 (0.92 – 11.36)
Volume	10	16.67 (9.32 – 28.04)
Liquefaction time	15	25.00 (15.78 - 37.23)
pH	12	20.00 (11.83 – 31.78)
Total sperm count	27	45.00 (33.09 – 57.51)
Sperm concentration	12	20.00 (11.83 – 31.78)
Progressive motility	23	38.33 (27.09 – 50.98)
Morphology	4	6.67 (2.62 – 15.93)

5. Discussion

The mean age of females included in the study was 27.08+_4.24years and the mean age of males was 30.51+_5.04years. It is consistent with studies by Paul C. Adamson et al (2011)[5] and Moumita Pal et al. (2018) [6]. In another study by Kalavathi DB et al 2016 [7], the mean age of the men was 28.4+_4.5 years with majority (54%) in the age group of 25-35years age group. Mahboubi M et al. 2013 [8] found mean age of infertile males 36.3+_10 years. However, the differences from the studies of abroad can be explained due to early age of marriage in India.

The prevalence of primary and secondary infertility in different studies can be summarized in the following table

Name of the author	Prevalence of primary infertility (%)	Prevalence of secondary infertility (%)
S. Samal et al. 2012 [11]	62.00	38.00
Abarikwu et al. 2013 [9]	70.80	29.20
Mahboubi M et al. 2013 [8]	85.20	14.80
KalavathiD.Biradar et al 2016 [7]	73.50	26.50
Present study	67.92	32.08

Not much studies are available on urban or rural precedence of infertility.

KalavathiD.Biradar et al. 2016 [7] in their study found that 85% of the patients were literate and about15% illiterate which is in agreement to our study where a total of 97.08% (233) patients were literate. The reason behind this may be stress and lifestyle changes coming with literacy.

In a study by UbongAkpan et al 2017 [10]conducted in Nigeria found out that maximum number (38.8%) of couples belonged to social class 3 i.e. middle class which is consistant with our study.

S. Samal et al 2012[11] conducted a study and found that the duration of infertility was 1 to 4 years in maximum number of patients i.e. 32.9% of primary infertility

Nwajiaku LA et al 2009 [12] in their study conducted on 268 infertility patients over a period of 5 years, that presented at NnamdiAzikiwe University Teaching Hospital,Nnewi, South East Nigeria 25.5% of the patients had solely male factor infertility which is consistent with our study.

Kalavathi D Biradar et al. 2016 [7] in their study conducted in Bangalore, over a period of six months on a total of 250 infertile couples found that 34.4% had abnormal semen parameters and 65.6% had normozoospermia, 25% had oligozoospermia, 8.4% had azoospermia, and only 1.3% had asthenozoospermia.

6. Conclusion

The contribution of male factor in infertility is high and many of the cases still remain idiopathic. So there is a need for public education on male factor in infertility as well as research on the topic to unmask the unknown causes leading to the problem. Male infertility is an important cause of infertility with a strong impact on the psychology and physiology of couple. It can be due to several reasons. Also, the present literature reveals that its trend is increasing in India. Therefore, it's the need of the hour to look into the factors which are causing such a rise in male infertility and attempts should be made to control such factors in near future.

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