A study on risk factors and seminal analysis among male partners of infertile couples attending an infertility clinic of a tertiary care hospital – a one year study

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Abstract

Introduction: Infertility is becoming an increasing concern in both developed and developing countries. However most of the studies mention variable differences in the prevalence of infertility, as it is known to differ from place to place and region to region globally. Semen analysis remains the most basic and simple test for evaluation of male infertility which is also inexpensive and can provide valuable information. Therefore, evaluation of semen parameters may provide an insight into the diagnosis of male infertility.

Objectives: The study was done mainly to assess the risk factors of male infertility and also to identify the contribution of male infertility in infertile couples.

Materials and Method: A prospective study was conducted among 400 couples attending infertility clinic and seminal analysis was conducted among the male partners of the study as per WHO guidelines 2010. The demographic data, risk factors of the male partners with abnormal seminal parameters are collected by interviewing and noted. Statistical analysis was done by using SPSS version 10.

Results: Incidence of male infertility in the study was 36% and the most common age group was 26-30 years with mean age of 34± 2.6 years, mean duration of marriage life was 3.8± 2.40 years. 61.11% of cases were exposed to occupational risk factors like driving, baker industry etc. Smoking, varicocele and past H/O urogenital tract infections were considered statistically significant factors in cases of male infertility. Oligozoospermia (50%) followed by Asthenozoospermia (38.9%) were common causes of male infertility.

Discussion: The pattern and causes of male infertility vary from place to place and among different regions. In our study the prevalence of male infertility was 36%. Smoking is known to have negative effects on sperm quantity, quality and morphology. Our findings were in accordance with many studies that showed smoking drastically reduces sperm motility and quality. To conclude, there is an increasing trend of male infertility in India when compared to previous years of studies. Hence studies and measures should be directed towards factors which are causing an alarmingly increasing rise in male infertility and attempts should be directed to control the causes in near future.

Keywords: Male infertility, Oligozoospermia, Asthenozoospermia, Varicocele.

Introduction

Infertility is becoming an increasing concern in both developed and developing countries. It's both a urological and gynecological problem. This has become more of a social stigma in developing countries. This is more felt by females than males who are often seen as being more responsible than the male in developing countries.[1] Infertility is defined as inability of a sexually active, non-contracepting couple, to achieve pregnancy in one year. However most of the studies mention variable differences in the prevalence of infertility, as it is known to differ from place to place and region to region globally. Infertility is an underlying pathology with females contributing to 30-40% of causes, males 30-40% and unexplained causes 20%. However, the etiology of male fertility is always neglected and remains unknown in many of the circumstances.[2] Most common conditions mentioned as the etiological factors include sexually transmitted infections which affect the seminal tract and affect the spermatogenesis, sperm function and may tend to cause obstruction of the tract. Other less common conditions include long standing endocrine disturbances, varicocele, and immunological factors. Modern life style and urbanization have been implicated as the causes of increased cases of male infertility in recent studies other than smoking and alcoholism.[3]

Presently there are a lot of diagnostic tools available for diagnosis and evaluation of male infertility. In spite of advanced techniques and tools, semen analysis remains the most basic and simple test for evaluation of male infertility which is also inexpensive and can provide valuable information. Therefore, evaluation of semen parameters may provide an insight into the diagnosis of male infertility. Analysis of seminal parameters may help in institution of further investigations if necessary and to institute appropriate treatment depending upon the etiology.[4]

Hence this study was done mainly to assess the risk factors of male infertility and also to identify the contribution of male infertility in infertile couples.

Materials and Method

A prospective cross sectional study was conducted by Department of Gynecology and Obstetrics in association with Department of pathology at Narayana General Hospital for a period of 18 months from October 2015 to March 2017. A total of 400 couples attending the infertility clinic of Department of gynecology were selected and male partner of the couple was selected by interviewing. Demographic data and clinical history of the selected cases was noted in a separate sheet by personal interviewing and clinical examination. Demographic data include age, period of marriage, past H/o exposure, past H/o surgery, genitor urinary infections, smoking and alcoholism. The study was approved by the institutional ethical committee.

Inclusion criteria: Male unable to conceive for 12 months after an unprotected intercourse with a normal fertile female. [Female with normal menstrual history, a normal Hysterosalpingogram, normal Ultrasonographic evaluation and normal luteal-phase endometrial biopsy specimen that was histologically consistent with menstrual dating]

Exclusion criteria: Men not willing for semen analysis.

Method of collection and analysis: Written informed consent was obtained from all the participants in the study. All the cases were adequately counseled and were instructed how to collect the specimen. Semen specimen was obtained at the hospital in a sterile container by masturbation after abstinence for a minimum period of 3-5 days. The specimen was immediately transported to the laboratory and macroscopic findings were recorded. [Volume, consistency, colour, etc]. The semen analysis was done according to the methods and standard outlined by WHO 2010 guidelines.[5] Fructose estimation was done by using Seliwinoff's reagent.1µl of semen was transferred onto improved Neubauer hemocytometer with help of micropipette and the sperm concentration was done. Morphology was assessed by smear preparation by using Diff-Quick stain. Motility and vitality of the sperm was done by using wet preparation and assessed for Progressive and non progressive motility and Leucocytospermia.

The operational definitions that were used were:
Normospermia: Sperm count of 15 million/ml or above.
Oligospermia: Sperm count of below 15 million/ml
Azoopsermia: Total absence of sperm in specimen.
Asthenospermia: Reduced sperm motility <40%
Teratozoospermia: reduced sperm morphology <4%
Oligo-astheno-teratozoospermia: all variables are abnormal.

Statistical analysis: Data was presented as mean ± SD (range) or n (%) of patients and were compared.

Statistical analysis was performed using SPSS version 10. P values <0.05 were considered significant.

Results

The present study was conducted at Narayana General Hospital a tertiary care hospital by department of Gynecology and Obstetrics in association with department of pathology. A total of 400 couples attending the infertility clinic for a period of 18 months were participants and male partners were selected by interviewing. Analysis of the 400 male partners revealed that 256 (64%) had normal parameters and 144(36%) had abnormal seminal parameters. Males with normal seminal study were excluded and with abnormal seminal partners were included. The age range of male partner in the study was 18->40 years with least age at 22 years and high at 43 years. The mean age was 34± 2.6 years and most common age group was 26-30 years (38.89%) followed by 31-35 years (28.47%). The duration of marriage life was from 1 year to > 12 years in the study. The mean duration was 3.8± 2.40 years. Most of the couples were with a marriage life of >3-6 years (33.3 %) followed by >6-9 years (30.3%). [**Table 1**]

61.11% (88/144) of cases with abnormal seminal parameters were exposed to occupational risk factors like driving, cooking for longtime in restaurants, exposed to toxic chemicals at dye industry, welders etc. where as 44.44% (64/144) were alcoholic, 50%(72/144) were smokers, 15.28% (22/144) with past H/o mumps infection, 19.44% (28/144) with h/o varicocele surgery and 27.78% (40/144) had past H/o urogenital tract infections.[**Table 1**] Most of the participants had overlapping of risk factors with two or three factors i.e. smoking and occupational risk. In the present study, significant association was observed between smoking, varicocele surgery and past H/O urogenital tract infection with abnormal seminal parameters. (p value <0.05)

Table 1: Demographic parameters of cases in the study

S. No	Parameter	No	%
1	**Age (In Years)**		
	18-25	10	6.94
	26-30	56	38.89
	31-35	41	28.47
	36-40	22	15.28
	>40 years	15	10.42
2	**Duration of married life**		
	1-3 years	20	13.9
	>3-6 years	48	33.3
	>6-9 years	44	30.6
	>9-12 years	18	12.5
	>12 years	14	9.7
3	**Risk factors of Infertility**		
	Alcohol	64	44.44

Smoking	72	50.00
Occupational risk	88	61.11
H/O Mumps	22	15.28
Varicocele	28	19.44
H/O Urogenital infections	40	27.78

In the present study, out of 144 cases of abnormal seminal parameters 8 cases were confirmed as azoospermia (5.6%). Oligozoospermia (50%) was the common condition (50%) followed in order by Asthenozoospermia (38.9%). Oligoasthenozoospermia was identified in 22.2%, Teratozoospermia in 13.9%, Asthenoteratozoospermia in 8.3%, Oligoteratozoopsermia in 5.6% and Oligoasthenoteratozoopsermia in 2.8% of cases in the study. These abnormalities were present singly as well as combinations in the cases of the study. [**Fig. 1**]
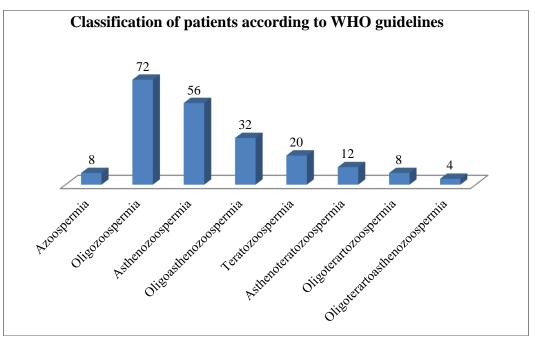

Fig. 1

Discussion

The pattern and causes of male infertility vary from place to place and among different regions. In our study the prevalence of male infertility was 36% which coincides with the findings of Kidd et al.[6] Pattern of increasing trend of male infertility is observed in recent studies globally which was observed in our study also. The most common age group in the study was 26-30 years which was similar to reports of Abari et al and Bodari et al.[7,8] Among 144 cases in our study, majority were having a marital life between 3-6 years which is similar to the findings in the study of Purohit et al and Joshi et al.[9,10] Smoking, past history of mumps and varicocele were significant risk factors for male infertility in our study which is similar to many of the studies universally.[11] Smoking is known to have negative effects on sperm quantity, quality and morphology .Our findings were in accordance with many studies that showed smoking drastically reduces sperm motility and quality.

Oligozoospermia was the most common abnormal seminal parameter in our study contributing to 50% of cases of male infertility. Findings of our study were similar to findings of Butt F et al who reported the 47% of cases of Oligozoospermia in his study.[12] Asthenozoospermia was the second common abnormal pattern in our study with 38.9% of cases, while Al Enezi reported 28% of cases in his study which is slightly less than the finding in our study.[13] Oligoasthenozoospermia was seen in 22.2% of cases which was similar to findings of Butt F et al but contrary to findings of Agu O et al who reported significantly higher cases in their study.[14] Teratozoospermia was found in 13.9% of cases which was slightly higher than many other studies the reason being not clearly known. In many of the cases of Teratozoospermia, occupational risk and old history of mumps was a significant risk factor observed in our study. Teratozoospermia and Asthenoteratozoospermia as a combined factor abnormality were seen in 8% of cases in our study which is similar to the findings of Purvis et al in their study.[15]

Conclusion

To conclude, there is an increasing trend of male infertility in India when compared to previous years of studies. Male infertility has a strong impact on the psychology and physiology relationships of the married

couple. Hence studies and measures should be directed towards factors which are causing an alarmingly increasing rise in male infertility and attempts should be directed to control the causes in near future. Hence further studies are required in this context focusing on molecular basis to identify the male infertility at an early time to prevent the social trauma to the married couples.

Conflicts of Interest
None

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