Original Article

Infertile Male

To Determine the Most Common Semen Abnormalities and Risk Factors Associated With Different Types of Semen Abnormalities in Infertile Male

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ABSTRACT

Objective: To determine the most common semen abnormalities and risk factors associated with different types of semen abnormalities in infertile male.

Study Design: Cross sectional study

Place and Duration of Study: This study was conducted in the Department of Obstetrics and Gynaecology, Unit B, Lady Reading Hospital Peshawar, for a period of one year from 1st January 2009 to 31st December 2009.

Materials and Methods: Hundred male patients with abnormal semen analysis were recruited after fulfilling the inclusion criteria. Semi structured Questionnaire was filled and data was collected regarding association of male infertility with common risk factors. Results were expressed in percentages. Descriptive statistics was applied using Microsoft Excel and the frequency and percentages were calculated.

Results: Among 100 infertile male patients, 44% patients had asthenospermia, 17% had oligospermia 14% had azoospermia, 13% had pyospermia and 12% had oligoasthenospermia. Drug addiction was (cigarette or cigarette plus THS) observed in 55% (n=55) of patients. Among all participants 46% (n=46) were overweight or obese, In 40% (n=40) infertile males, there were coital problems. Systemic illness was found to be in 34% (n=34) of males with infertility, of all the participants largest number of infertile males were farmers 19% (n=19).

Conclusion: Asthenospermia accounted for the frequently associated problem of abnormal semen analysis followed by oligospermia, azoospermia pyospermia and oligoasthenospermia respectively. Cigarette smoking and obesity are the most frequently associated risk factors.

Key Words: Male Infertility, Semen Abnormalities, Oligospermi

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INTRODUCTION

The inability to conceive children is experienced as a stressful situation by individuals and couples all around the world. The consequences of infertility are manifold and can include societal repercussions and personal suffering. It is defined as the inability to conceive after at least one year of unprotected intercourse, it affects about 8-12 % of all married couples. In about one third of these couples, a male factor is the primary problem and in another one quarter, both the male and the female partner contribute to the infertility. Recognizable causes of male infertility are present in about 40-50 % of cases .In Pakistan the prevalence of male infertility is reported as 21.91%.[1-3]

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In men risk factors for infertility, such as male accessory gland infection (including epididymitis and prostatitis), mumps orchitis, varicocele and cryptorchidism are well documented.[4,5] Several studies have demonstra
ted the hazardous effect of environmental factors such as toxic substances. pesticides and radiation on male reproductive function.[6,7] The abuse of tobacco, alcohol and caffeine also have been linked with male infertility[8, 9].most of these factors are preventable. Incidence of preventable infertility is much higher in developing countries.[4] Treatment of male fertility is expensive and there is no surety and in poor country like us it cannot be easily afforded. The other main problem is delay in seeking treatment because of stigma attached to male infertility.

Semen analysis is a key element in the fertility evaluation of men and permits male reproductive potential to be evaluated in association with possible

risk factors. This study was conducted to determine the most common risk factors of male infertility in men attending the infertility clinic so awareness is created to possibly avoid them.

MATERIALS AND METHODS

This study was conducted in Gynae B unit LRH from1st January 2009 to 31st December 2009. Couples presented with infertility to Gynae OPD were further investigated. The males with abnormal semen analysis were enrolled in study, after the procedures had been described to them. A separate room in Gynae OPD was used for these male infertile patients. Men with recent history of febrile illness and reversal of vasectomy, and men with normal semen analysis were excluded. A detailed history and physical examination was carried out. The structured questionnaire was designed to obtain relevant medical and reproductive health history, and lifestyle information. Two semen analyses of not less than fourteen and not more than ninety days apart were routinely undertaken. Semen samples were obtained by masturbation after 3-5 days sexual abstinence. Semen assessment was performed within one hour from collection according to the routine method described by WHO.[10] The descriptive statistics was applied using Microsoft Excel and the frequency and percentages were calculated. W.H.O criteria for Semen analysis was used i.e. volume 2ml or more, PH 7.2-7.8, Sperm concentration >20x10^6 cell/ml, Motility of >50% forward movement, Morphology >30% of normal form, WBC <1x10^6 cells/ml, Abnormal sperm parameters were, Azoospermia-(no sperm / cell) Oligospermia (<20x10^6 sperm/ml), Asthenozoospermia (abnormal motility).[10]

RESULTS

Total of 100 males with infertility was evaluated. In this study it is observed that infertility is most commonly observed in males within the age group of 35-50 years (Table 1). The most common abnormality of semen analysis was asthenozoospermia which was found in 44% (n=44) patients .Other abnormalities observed are shown in Table 2. Fertility status (whether primary or secondary) was noted with each type of semen abnormality found (Table 3). A history of systemic illness, alcohol consumption and tobacco smoking. STIs, occupation, coital problems, testicular damage, and maldescent, and varicocoele , was obtained and it was found that they had statistically significant associations with impaired semen quality. In this study it was observed that 55% (n=55) had no history of medical illness, the frequency of medical illness with different types of semen abnormality is shown in Table 4. Among all participants 46% (n=46) were overweight, varicocele was present in 18%(n=18), undesended testis was observed in 9% (n=9) of all patients ,considering occupation farmers 19%(n=9) and drivers 17% (17) were most commonly effected ,drug addiction to cigarette alone or with chars was found in 55% (N=55) ,coital problems were present in 40%(n=40) of these men , antidepressants were being used by 39% (n=39)of these infertile males.

Table No.1: Age of patient presented with infertility

Age (years)	No.	%
> 24	7	7.3
25 – 34	26	26.0
35 – 50	51	51.0
> 50	16	16.0

Table No.2: Type of abnormality

Type of abnormality	No.	%
Asthenospermia	44	44.0
Oligospermia	17	17.0
Azoospermia	14	14.0
Pyospermia	13	13.0
Oligoasthenopermi	12	12.0

Table No.3: Fertility status

Type of infertility	Asthenospermia N=44	Oligospermia N=17	Azoospermia N=14	Pyospermia N=13	Oligoasthenopermi N=12	Overall analysis
Primary	25	10	14	7	10	66%
Secondry	19	7	0	6	2	34%

DISCUSSION

The male factor is the cause of the infertility in about one third infertile couples and is regarded as a condition that is difficult to treat in a low-cost setting. The risk factors of male infertility differ from one country to another, so it is important that any developing country should determine the most influential factors in their population. In this study Asthenospermia 44% (n=44) accounted for the frequently associated problem of abnormal semen analysis followed by oligospermia 17% (n=17), azoospermia 14% (n=14) pyospermia 13% (n=13) and oligoasthenospermia 12% (n=12) respectively. Another study on the aetiological factors of infertility also shows asthenospermia as the most common abnormal semen parameter (63.23%), while the second third and fourth common abnormal parameters were oligospermia, azoospermia and pyospermia respectively.[11]

Age was observed and In this study the maximum number of infertile male were between 35 and 50 years of age. As men age, their testes tend to get smaller and softer, and sperm morphology (shape) and motility (movement) tend to decline. In addition, there is a slightly higher risk of gene defects in their sperm. Aging men may develop medical illnesses that

adversely affect their sexual and reproductive function. Another study shows that paternal age of >35 years halves the chance of achieving a pregnancy compared with a paternal age of <25 years.[12] The effect of age on male fertility is more noticeable after the age of 50[13], with studies showing a concomitant increase in adverse outcome in the offspring.[14,15]

Table No.4: Association of common risk factors and male infertility

Risk Factors	Astheniospermia N=44	Oligospermia N=17	Azospermia N=14	Pyospermia N=13	Oligiasthenospermia N=12	Overall
No significant problem	59%(n=26)	88.23%(n=15)	50% (n=7)	15.38%(n=2)	41.66%(n=5)	55%
Recurrent UTI	9.09%(n=4)	11.76%(n=2)	7.14% (n=1)	30.76%(n=4)	16.66%(n=2)	13%
STI	9.09%(n=4)	Nil	Nil	46.15%(n=6)	8.33%(n=1)	11%
Mumps/orchitis	6.81%(n=3)	Nil	14.28%(n=2)	7.69%(n=1)	25%(n=3)	9%
Recurrent uRTIs	4.54%(n=2)	Nil	21.42%(n=3)	Nil	8.33%(n=1)	6%
Chronic Gastritis	4.54%(n=2)	Nil	Nil	Nil	Nil	2%
Hypertensive	2.27%(n=1)	Nil	Nil	Nil	Nil	2%
Asthamatic	2.27%(n=1)	Nil	7.14% (n=1)	Nil	Nil	2%
Normal BMI (18.5-24.9)	47.72% (n=21)	58.8%(n=10)	50%(n=7)	53.84%(n=7)	75%(n=9)	54%
Overweight (25-29.9)	36.36% (n=16)	29.41%(n=5)	35.71%(n=5)	38.46%(n=5)	75%(n=9)	34%
Obese (30 and above)	15.90% (n=7)	11.76%(n=2)	14.28%(n=2)	7.69%(n=1)	Nil	12%
No abnormality	77.27%(n=34)	76.47%(n=13)	78.57%(n=11)	100%(n=13)	83.33%(n=10)	77%
Unilateral varicocele	13.63%(n=6)	5.88%(n=1)	14.28%(n=2)	Nil	8.33%(n=1)	10%
bilateral (Varicocele	9.09%(n=4)	11.76%(n=2)	7.14%(n=1)	Nil	8.33%(n=1)	8%
No abnormality	88.63%(n=39)	82.35%(n=14)	35.71%(n=5)	76.92%(n=10)	66.66%(n=8)	76%
Unilateral undescended testes	6.81%(n=3)	5.88%(n=1)	Nil	7.69%(n=1)	8.33%(n=1)	6%
Bilateral undescended testes	Nil	NIL	21%(n=3)	Nil	NIL	3%
Swollen tender testes	2.27%(n=1)	5.88%(n=1)	Nil	7.69%(n=1)	8.33%(n=1)	4%
Small sized Testes	2.27%(n=1)	5.88%(n=1)	35.71%(n=5)	7.69%(n=1)	Nil	8%
Hypospadias	Nil	Nil	7%(n=1)	Nil	8.33%(n=1)	2%
Drivers	20.45%(n=9)	11.76%(n=2)	28.47%(n=4)	15.38%(n=2)	Nil	17%
Farmers	11.36%(n=5)	35.29%(n=6)	21.42%(n=3)	7.69%(n=1)	33.33%(n=4)	19%
Shopkeepers	11.36%(n=5)	17.64%(n=3)	Nil	7.69%(n=1)	16.66%(n=2)	11%
Cook	11.36%(n=5)	Nil	14.28%(n=2)	Nil	Nil	7%
Laborer	9.09%(4)	29.41%(5)	1(7.12%)	5(38.46%)	Nil	14%
PCO operator	9.09%(4)	Nil	Nil	Nil	Nil	4%
Painter	6.81%(3)	Nil	Nil	1(7.69%)	8.33%(1)	5%
Soldier	4.54%(2)	Nil	Nil	Nil	8.33%(1)	3%
Tailor	4.54%(2)	Nil	1(7.12%)	2(15.38%)	25%(3)	8%
Butcher	2.27%(1)	Nil	1(7.12%)	Nil	Nil	2%
Pharmacist	2.27%(1)	Nil	Nil	Nil	8.33%(1)	2%
Teacher	2.27%(1)	Nil	Nil	Nil	Nil	1%
Clerk	2.27%(1)	Nil	Nil	1(7.69%)	Nil	2%
Welder	2.27%(1)	Nil	1(7.12%)	Nil	Nil	2%
Cobbler	Nil	5.88%(1)	1(7.12%)	Nil	Nil	2%
Cigarette + Chars	27.27% (n=12)	23.52%(4)	14.28%(n=2)	23.07%(n=3)	16.66%(2)	23%
Cigarette Only	34.09%% (n=15)	11.76%(2)	35.71%($n_{=5}$)	30.76%(n=4)	50%(6)	32%
Not addicted	29.54%(n=13)	58.82% (10)	42.85%(n=6)	38.46%(n=5)	5 (41.66%)	39%
Alcohol	9.09%(n=4)	1 (5.88%)	1 (7.12%)	Nil	Nil	6%
No Coital problems	24 (54.54%	12 (70.558%	6 (42.85%	10(76.92%)	8(66.66%)	60%
Prolonged abstinence	13 (29.54%)	2(11.76%)	Nil	1(7.69%)	3(25%)	19%
Decreased Libido	5(11.36%	1(5.88%)	5(35.71%)	1(7.69%)	Nil	12%
Erectile Dysfunction	Nil	Nil	3 (21.42%)	1(7.69%)	Nil	4%
Premature Ejaculation	2 (4.54%	2(11.76%)	Nil	Nil	1(8.33	5%
Antidepressants	15(34%)	5(29.41%)	6(42.85%)	3(23.07%)	5(41.66%)	34%
Amiodarone	1(2.27%)	1(5.88%)	Nil	1(7.69%)	1(8.33%)	4%
Cimetidine	6(13.63%)	1(5.88%)	3(21.42%)	3(23.07%)	1(8.33%)	14%
Sulfasalazine	Nil	Nil	1 (7.14%)	Nil	Nil	1%
Phenothiazines	2(4.54%)	Nil	Nil	1(7.69%)	Nil	3%
Spironolactone	Nil	Nil	Nil	Nil	1(8.33%)	1%
Alpha- blockers	2(4.54%)	1(5.88%)	Nil	1(7.69%)	1(8.33%)	5%
No medicine used	24(54.54%)	7(41.17%)	4(28.57%)	4 (30.76%)	3(25%)	42%

In this study the maximum number of infertile male were between 35 and 50 years of age. Asthenospermia was most commonly found in drivers 20.45% (n=9). Another factor was the addiction status with majority being addicted to cigarette 34.09% (n = 15). Obesity was found in 36.36% (n=16) of patients with asthenospermia. Other important factor associated with Asthenospermia was prolonged abstinence from sexual activity 29.54% (n=13). Chronic systemic illness was not commonly observed in these patients, UTI and STI being present in only 9.09% (n=4). Varicocele was present in 2.27 % (n=10) of patients with asthenospermia. Another study showed association between male infertility and drivers, Scrotal temperature increased significantly (P<0.0001) in driving posture after 2 h of driving, reaching a value 1.7-2.2°C higher than that recorded while walking. Increase scrotal temperature is associated with abnormal sperm parameters.[16] There is evidence that a sedentary lifestyle, most likely through elevated scrotal temperature, can affect sperm production.[17] Second common abnormality was oligospermia. Most of these were farmers 35.29% (n=6). It is possible that there exposure to pesticides while working in fields could have led to this problem. Raised BMI was observed in 29.41% (n=5), cigarette and chars addiction was seen in 23.52% (n=4).

Obesity is an important lifestyle factor that has been shown to be associated with poor semen quality.[18,19] The mechanism by which obesity causes altered semen parameters is thought to be through an imbalance of reproductive hormone levels, as obese men have reduced sex hormone binding globulin and elevated estrogen levels. Altered metabolism of environmental toxins, sedentary lifestyle factors and increased risk of sexual dysfunction are also thought to contribute to reduced fertility in heavier men.[19] In this study 34% were overweight and 12% were obese.

Azospermia was observed in 13 patients, majority of them were taking antidepressants 42.85% (n=6), small sized testis were found in 35.71% (n=5) majority of them were drivers 28.47% (n=4). Among them 35.71% (n=5) were smoking cigarettes. In another study Tobacco smoking and cannabis consumption have been shown to reduce semen parameters.[20]

Pyospermia were noted and 46.15% (n=6) were having STI's while 30.76% (n=4) had recurrent UTI's, making these two the major factor associated with it. Majority of them were laborer 38.46% (n=5). In another study Pyospermia is found on the semen analysis of up to 23% of men who are being investigated for infertility. The presence of significant numbers of white blood cells in the semen is correlated with poorer sperm parameters and diminished fertility. pyospermia is oftenly associated with underlying genitourinary infection. Treating these patients with different antibiotics regimens appears to reduce temporarily the white blood cell count in the semen and improve the fertility rates.[21]

Oligoasthenospermia was most common in farmers 33.33% (n=4), drug addiction (cigarette) was present in 50% (n=6), prolonged abstinence was there in 25% (n=3) recurrent UTI was a problem in 16.66% (n=2). Another study showed that prolonged abstinence from sexual activity adversely effect sperm parameters. They observed that 5,983 normozoospermic samples showed a significant decrease in the percentage of sperm motility and normal morphology to mean values of 33.1% and 7.0%, respectively, as a result of sexual abstinence.[22]

Varicoceles, a collection of dilated refluxing veins in the spermatic cord, are found in 11.7% of men with normal semen and 25.4% of men with abnormal semen.[23] The exact mechanism by which a varicocele can affect fertility is not well understood but theories include increased scrotal heating and altered testicular steroidogenesis.[24] In this study 10% had unilateral varicocele while 8% had bilateral varicocele. Cryptorchidism is failure of descent of the testes into the scrotum during fetal development. This may result in the testes being within the abdomen, inguinal canal, or other location. Both unilateral and bilateral cryptorchidism, are associated with impaired spermatogenesis and an increased risk of testicular tumours. In one other study undesended testis were reported in 7.8% of patients with male infertility.[25] In this study 9% of males were having cryptorchidism. Certain Medications taken for one purpose or another also effect fertility, In this study 34% were taking antidepressants. The effect of antidepressants on infertility is shown in study conducted by Aldhous.[26]

CONCLUSION

Male infertility is an important aspect of health care, and semen analysis still remain the basic test and choice of investigation before embarking on any sophisticated techniques to investigate male patients with infertility. Healthy life style and awareness about the preventable causes of male infertility can make a difference in number of infertile male. Drug addiction, obesity and coital problems were major risk factors associated with infertility in this study. Gynae OPDs must have infertility clinics on weekly basis, where the couples and not the husbands or wives alone should be thoroughly evaluated.

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