

Abnormalities of Semen in Infertile Couples

Rukhsana Sheikh, Nasreen Fatima, Samreen Iqbal

ABSTRACT

Objective To determine the frequency of abnormality of semen in infertile couples presenting to a tertiary care hospital.

Study design Cross sectional study.

Place & Duration of study Department of Obstetrics and Gynaecology, Unit II (ward-9) Jinnah Postgraduate Medical Centre Karachi, from January 2012 to June 2012.

Methodology Sixty male members of infertile couples with ages between 18 – 50 year, who were referred to infertility clinic included in this study. After five days of sexual abstinence, patient's semen analysis was done according to the WHO protocol.

Results The mean age of the patients was 33.32±6.04 year. Abnormality of semen was found in 18(30%) cases. Out of this azoospermia was found in one (1.7%), oligozoospermia in three (5%) and asthenozoospermia in 14(23.3%) men.

Conclusions This study demonstrated that abnormal semen quality was a major factor of infertility in present cohort. The most common abnormality was poor motility of sperms.

Key words Infertility, Azoospermia, Oligozoospermia, Asthenozoospermia.

INTRODUCTION:

Infertility is defined as inability to conceive after twelve months of regular unprotected intercourse.¹ Globally, the male related factors are present in nearly one third couples affected by infertility.² It is only in the past few decades that male factors have been recognized as a significant cause of infertility. Male infertility encompass variety of pathogenetic mechanisms.³ Pakistan is among the currently most populous countries of the world, and has a population growth rate of around 2%. It also has a high infertility rate (21.9%); 3.5% primary and 18.4% secondary.^{4, 5}

Male infertility is defined as the inability of a male to achieve a pregnancy in a fertile woman. Male infertility

is most commonly due to the abnormality of the semen. Thus the assessment of semen quality is used in diagnostic workup of male fecundity. Male infertility may manifest as quantitative abnormality (azoospermia, cryptozoospermia and oligozoospermia), or as qualitative abnormality (asthenospermia, teratozoospermia and necrospermia) or both.^{6,7} The causes of male infertility are numerous and can be divided into five major categories: (i) disorders related to motility or sperm function, (ii) disorders related to obstructive lesions, (iii) disorders related to spermatogenic failure, (iv) sexual dysfunction disorders of erection and ejaculation, and (v) endocrine dysfunction. Both environmental and genetic factors, combined or separate, have been reported. No clear causal factor could be diagnosed in about 50% of cases. This falls into the category of idiopathic male infertility. These men usually have normal findings on physical examination. Traditionally male related factors are not kept up front and women are usually considered responsible for not being able to conceive. Considering high infertility rate in Pakistan

Correspondence:

Dr. Nasreen Fatima
Department of Obstetrics & Gynaecology Unit- II
Jinnah Postgraduate Medical Center
Karachi
E mail: drnasreenf@gmail.com

it is important to find out male related factors contributing to infertility.

METHODOLOGY:

This cross sectional study was conducted in the outpatient of the Department of Obstetrics and Gynaecology unit –II, Jinnah Postgraduate Medical center Karachi, from January 2012 to June 2012. Sixty male members of the infertile couples referred from infertility clinic were enrolled in the study after taking informed consent.

Married couples with history of any type of contraceptive use within a year of presenting to the clinic, male age <18 or >50 year, use of drugs such as cocaine, marijuana, chain smokers and excessive alcoholics, varicocele and testicular injury in the past, patients with diseases such as tuberculosis, tumors, and advanced cardiac diseases were excluded. Patient's semen was taken after five days of sexual abstinence and sent to the designated laboratory where analysis was performed according to the procedure described in the WHO protocols.

Semen was examined for the presence of azoospermia, oligozoospermia and asthenozoospermia. These results were reviewed by the researcher and final outcome recorded on proforma. Statistical Packages for Social Science (SPSS-10) was used to analyze data. Frequency and percentage were computed for qualitative variables like abnormality of semen. Mean and standard deviation were computed for age and duration of marriage and duration of unprotected sex. Effect modifiers like age, duration of marriage

and duration of unprotected sex were controlled by stratification techniques.

RESULTS:

A total of 60 male patients of infertile couples were included. The age of the patient ranged from 18 year to 50 year. Most of the patients were between 24 year to 40 year of age. The mean age of the patients was 33.32 ± 6.04 year (95%CI: 31.76 to 34.88) and mean volume of the semen was 2.79 ± 0.91 cc. Mean duration of marriage was 5.78 ± 3.85 year (95%CI: 4.79 to 6.78). Details are given in table I.

Frequency of abnormality of semen was found in 18(30%) men. Azoospermia was noted in one (1.7%) and oligozoospermia in three (5%). Most common qualitative abnormality the asthenozoospermia was reported in fourteen (23.3%) males. Frequency of abnormality of semen in infertile couples with respect to age groups is presented in table II. Azoospermia was observed in men aged 24 year to 30 year of age only. Oligozoospermia was observed in all age groups while asthenozoospermia was slightly high in age group between 31 year to 40 year.

Frequency of abnormality of semen in infertile couples with respect to duration of marriage is presented in table III. Oligozoospermia and asthenozoospermia were commonly observed in those men where duration of marriage was below 5 years and 6 to 10 years respectively. The frequency of abnormality of semen in infertile couples with respect to duration of unprotected sex is presented in table IV.

Table I: Characteristics of Patients

Variables	Mean \pm SD	95%CI	Median (IQR)	Max-Min
Age (Year)	33.32 ± 6.04	31.76 to 34.88	32 (11)	45-24
Duration of marriage (Years)	5.78 ± 3.85	4.79 to 6.78	5 (4)	18-2
Duration of unprotected sex	5.78 ± 3.84	4.79 to 6.78	5 (4)	18-2
Amount of semen (cc)	2.79 ± 0.91	2.54 to 3.03	2.5 (2)	5-1

Table II: Frequency of Abnormality of Semen in Infertile Couples with Respect to Age Groups

Age Groups	No (n)	No Abnormality	Semen Abnormality		
			Azoospermia	Oligozoospermia	Asthenozoospermia
24 to 30 Year	27	21	1	1	4
31 to 40 Year	24	17	0	1	6
>40 Year	09	4	1	1	4

Table III: Frequency of Abnormality of Semen in Infertile Couples with Respect to Duration of Marriage

Duration of Marriage	No (n)	No Abnormality	Semen Abnormality		
			Azoospermia	Oligozoospermia	Asthenozoospermia
= 5 Years	36	25	1	2	8
6 to 10 Years	17	12	0	0	5
>10 Years	07	5	0	1	1

Table IV: Frequency of Abnormality of Semen In Infertile Couples With Respect To Duration of Unprotected Sex

Duration of Unprotected Sex	No (n)	No Abnormality	Semen Abnormality		
			Azoospermia	Oligozoospermia	Asthenozoospermia
2- 4 Years	29	22	1	2	4
5 to 10 Years	24	15	0	0	9
11-18 Years	07	5	0	1	1

DISCUSSION:

The result of this study showed that frequency of abnormality of semen in infertile couples was found in 30% of men. The frequency of male infertility amongst infertile couples is reported as 59% in France, 26% - 32% in the UK and Kashmir Valley in India, and about 36% in South Africa, Indonesia and Finland.⁵ Other studies indicated that there was also a regional variation in the mean sperm concentration in men from different regions of the USA and France.⁸⁻¹⁰ However in another study the prevalence of infertile male was 27.3%.¹¹

In index study it was observed that poor motility and low sperm density were the two common abnormalities. Several studies have determined and explored the frequency of abnormality of semen in infertile couples.¹¹⁻¹³ A study conducted in Pakistan showed that 35.71% of subjects with low sperm density were either azoospermic (14.28%) or oligozoospermic and 21.43% asthenozoospermic.¹² There is increasing trend in reporting of male infertility all over the world.¹⁴ Adenji et al also observed asthenozoospermia and oligospermia were the two common abnormalities with the rate of 27.8% and 18.9% respectively.¹¹

The reasons of abnormal spermatogenesis that result in decrease in density, motility or fertilizing capability of spermatozoa are much harder to define. This is because of reporting of fertility in some men with poor counts and variation that occurs even in normal fertile men.¹⁵ Sperm concentration is clearly a major characteristic related to the occurrence of conception, however, low sperm

concentration was shown to exist in couples with fertile male partner.¹⁶

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.¹⁷ Some factors however have been noticed to effect the quality of semen. These are frequency of sexual intercourse and method of semen collection. Prolonged abstinence is associated with increase sperm concentration, while shorter period, though may improve motility, can lead to low sperm density.

Asthenozoospermia was reported more frequently in age groups between 31 year to 40 year but was also noted in all age groups. Age is important risk factor for conception both for men and women. The peak rate of conception occurs at the age of 24 year both for men and women. After the age of 35 year the rate begins to decline significantly.¹⁸ Studies have shown that blood testosterone level decline with age, and the risk of becoming infertile doubled in men who are over 35 year compared with men who are under 25 year. Men at the age of 45 year take five times longer to conceive.¹⁹ Production of testosterone hormone begins to decrease around the age of 40 year. The sperm quality also changes with aging. There is a decrease in the semen volume, motility of sperms and abnormal morphology.²⁰ Studies showed that sperm concentration is stable, but the percentage of motility is the only parameter which decrease with age, and the fertilizing capacity does not decreased.^{21,22}

CONCLUSIONS:

Abnormal semen quality was a major factor found in 30% of male partners of infertile couples. The most common single abnormality was poor motility of the sperms.

REFERENCES:

1. Hammond CB, Stillman RJ. Infertility and assisted reproduction danforth's obstetrics and gyneacology. 8th ed. Lippincott Williams and Wilkin: Scott JR; 1999. pp. 649-67
2. Seibel MM. Infertility A Comprehensive Text. Appleton & Lange, Norwalk: Connecticut. USA; 1990. pp. 1-21.
3. Shakkeback VE, Giwerzman A, de-krester D. Pathogenesis and management of male infertility. Lancet. 1994;343:1473-9.
4. Tahir F, Shahab M, Afzal M, Subhan F, Sultan S, Kazi BM, et al. Male reproductive health: An important segment towards improving reproductive health of a couple. In: M.A. Chaudhry and M. Desousa, editors. Population research and policy development in Pakistan. Population Association of Pakistan: Pakistan; 2004. pp. 227-48
5. Thonneau P, Marchand S, Tallec A, Ferial ML, Ducot B, Lansac J, et al. Incidence and main causes of infertility in a resident population (1,850,000) of three French regions (1988-1989). Hum Reprod. 1991;6:811-6.
6. Hargreave TB. Genetic basis of male fertility. Br Med Bull. 2000;56: 650-71.
7. Ferlin A, Arredi B, Speltra E, Cazzadore C, Selice R, et al. Molecular and clinical characterization of Y chromosome microdeletions in infertile men: a ten year experience in Italy. J Clin Endocrin Metabol. 2007;92:762-70.
8. Leke RJ, Oduma JA, Bassol-Mayagoitia S, Bacha AM, Grigor KM. Regional and geographical variations in infertility: effects of environmental, cultural, and socioeconomic factors. Environ Health Perspect. 1993;101:73-80.
9. Fisch H, Goluboff ET. Geographic variations in sperm counts: a potential cause of bias in studies of semen quality. Fertil Steril. 1996;65:1009-14.
10. Auger J, Jouannet P. Evidence for regional differences of semen quality among fertile French men. Federation Francaise des Centres d'Etude et de Conservation des Oeufs et du Sperme humains. Hum Reprod. 1997;12:740-5.
11. Adenji RA, Olayemi O, Okunlola MA, Aimakhu CO. Pattern of semen analysis of male partners of fertile couples at the Univerity of college hospital, Ibadan. West Afr J Med.2003;22:243-5.
12. Razzak AH, Wais SA. The infertile couple: a cohort study in Duhok, Iraq. East Mediterr Health J. 2002; 8: 234-238.
13. Ugboaja JO, Monago EN, Obiechina NJ. Pattern of semen fluid abnormalities in male partners of infertile couples in south eastern Nigeria. Niger J Med. 2010;19: 286-8.
14. Memon BA, Bhatti K. Abnormalities of semen and incidence of azoospermia in Sukkur region. Rawal Med J. 2010;35:173-6.
15. Hammond CB, Stillman RJ. Infertility and assisted reproduction Danforth's obstetrics and gynaecology, 8th ed. Lippincott Williams and Wilkin. 1999. pp. 649-67.
16. Feneux D, Ducot B and Jeulin C. Caracteristiques du sperme des homes feconds et infeconds similtudes et differences. Pan Masson. 1986;3-41.
17. Ayala C, Steinberger E, Smith DP. The influence of semen analysis parameters on the fertility potential of infertile couples. J Androl. 1996;17:718-25.
18. Griffin JE. The physiology of the testis and male reproductive tract and disorders of testicular function. In: Carr BR, Blackwell RE. Reproductive medicine. USA: Appleton and Lange. 1993; pp. 221-44.
19. Pasqualotto FF, Borges JE, Pasqualotto EB. The male biological clock is ticking: a review of the literature. Sao Paulo Med J. 2008;126:197-201.
20. Bayer SR, Alper MM, Penzias AS. The

- Boston IVF handbook of infertility: a practical guide for practitioners who care for infertile couples. 2nd ed. London: Informa healthcare. 2007. p.259.
21. Paulson RJ, Milligan RC, Sokol RZ. The lack of influence of age on male fertility. Am J Obstet Gynecol. 2001;184:818-22.
22. Pasqualotto FF, Sobreiro BP, Hallak J, Pasqualotto EB, Lucon AM. Sperm concentration and normal sperm morphology decrease and follicle-stimulating hormone level increases with age. BJU Int. 2005;96:1087-91.