

Pattern of semen abnormalities in couples with male factor infertility

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Abstract

Objective: To determine the pattern of semen abnormalities in couples with male factor infertility.

Study design: Descriptive study.

Setting: Gynae unit II, civil hospital Karachi.

Material & methods: All the patients were identified from subfertility clinic with male factor alone. Semen analysis was the basic investigation done & the different parameters were analyzed.

Result: Out of 50 patients 82% were between 20-35 years, 14% between 36-50 and 4% were above 50 years. 56% consulted subfertility clinic within 1-5 years of their marriage. 26% in 6-10 years, and 18% in 11-20 years. 58% were smokers, and 6% were alcoholic and 6% were addicted to tobacco chewing. Out of 50 patients 4% had volume <2ml, 8% had liquefaction >30 minutes. 4% had PH <7.2%, 12% were Azoospermic, 32% were oligozoospermic out of which 8% had mild to moderate while 24% had severe oligozoospermia. 26% had altered morphology and 6% showed the abnormal presence of white-cells. 16% of the patients have left sided while 4% showed right sided varicocele. 2% had impotency problem, 2% had diabetes mellitus, 2% had history of herniorrhaphy, 6% had past history of mumps, and 2% had history of premature ejaculation.

Conclusion: Semen analysis by its different parameters provide information about the spermatogenesis, patency of the tract and hormonal status.

The most common abnormality found was oligozoospermia & abnormal motility (asthenospermia). The second common abnormality was altered morphology (tetraozoospermia) which are the good predictor of fertility potential.

Keywords: Subfertility, Oligospermia, Azoospermia, Tetraozoospermia, Asthenospermia.

Introduction:

Infertility is a global problem. Fertility has been one of the man's desired attribute since the beginning of recorded history and remains a need for young couple today. The infertility has defined a the inability to conceive over 12 months of regular unprotected intercourse affecting 1 in 6 couple.¹ It is believed that 30% it is solely due to male factor² while in another 20% both partners are involved its incidence is same if not more in Pakistan as anywhere else but the desire to conceive is much more here than many other parts of the world.³ The male is becoming

increasing important in the diagnosis and treatment of human subfertility, when one or more sperm parameters are below normal then chances of fertilization and pregnancy are greatly reduced. There is controversy on the normal semen analysis. Consequently, many men who are previously categorized as sterile are now classified as sub-fertile.

Normal semen analysis on properly collected specimen invariably excludes a significant male factors. The semen analysis is one of the basic measures to assess the male role in normal fertility.

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In the past major focus of infertility problems has been on female patients. So it is traditionally the gynecologist to whom couple is referred. Previously male partners were treated by Urologist or surgeons, recently due to various advances in field of assisted reproductive techniques, Gynecologist is now able to offer a modern treatment to infertile male as well. Treatment of infertility is becoming a team work now a days.

The commonest factor responsible for male infertility are smoking, pollution, fever, diabetes, surgery, post pubertal mumps viral and veneral diseases.⁴ Other factors may be important like exposure to chemical or radiation or thermal substances. Certain drugs such as alcohol, marijuana, steroid and salozopyrin have adverse effect on sperm quantity and quality. Most lubricant used with sexual intercourse have a toxic effect on sperm production.⁵

Stress and excessive exercise are also factor that can effect sperm parameter.⁶

Most of these factors are responsible for male infertility and impairs the quality of semen. The most common cause of infertility in man is low sperm count (oligospermia), while low number of motile sperms is another cause of infertility.⁷

The purpose is to determine the pattern of semen abnormalities in couples with male factor infertility having decreased semen volume altered PH, presence of increase number of pus cells, decreased motility, altered sperm morphology, oligospermia / azoospermia, etc. So that the most common abnormalities of the semen parameters is determined and the probable cause of infertility in male can be identified. It also provides accurate information regarding prognosis and the guidance regarding the option for treatment.

Operational definitions

- Decreased volume: when the quantity is less than 2ml. Aspermia is the total absence of ejaculation.
- Decreased PH: when the PH is less then a 7.2.
- Mild to moderate oligozoospermia: when

the sperm count is in between 5-20 million per ml.

- Severe Oligozoospermia: when the sperm count is less then 5 million perml.
- Azoospermia: when there is no sperm in ejaculation.
- Altered Morphology: when there is more than 30% abnormal sperm.
- Presence of pus cell: when the pus cell is more than 1×10^6 /ml.

Material and methods

The study was conducted in infertility clinic at Out-Patient-Department Gynae Unit II, Dow Medical College and Civil Hospital Karachi from October 2005 to May 2006. Sample technique was non-probability purposive. Total number of 50 patients were included in the study with male factor infertility having abnormal semen pattern.

Inclusion criteria:

1. Couples married for atleast 12 months.
2. Couple having regular unprotected intercourse for 12 months.

Exclusion criteria:

1. Couples with female factor infertility.
2. Men who fathered a child in past two years with another woman.

Data collection procedure:

All the subfertile patients were identified from the subfertility clinic in OPD Gynae Unit-II Civil Hospital Karachi. Then detailed history of the couple followed by complete examination of female partner was recorded and male partner examined by surgeon trained in specialty (Surgical Unit II, CH). Relevant investigations were sent and female factor infertility were ruled out. Regarding Male factor the basic investigation was semen analysis. All semen samples were obtained after minimal sexual abstinence for 2 to 3 days and preferably produced with in concerned lab (Kazi Lab in the city premises by masturbation and those who found it to be difficult were brought the sample with 30 to 60 mins to the Lab to optimize the liquefaction. Before collection the whole procedure was explained to the

male partner. The different parameters considered were quantity, consistency, PH, Volume, Total Count, Motility, Morphology, Pus cells, etc., Considering above

parameters pattern of semen abnormalities in couple with male factor fertility infertility was determined. WHO Giteria 1999 for normal serer analysis was taken standard for comparison,

Statistical analysis

Data was analyzed by using SPSS. Version -10 on computer. Descriptive statistics like frequency percentage, average etc were computed for data presentation. Test of significant were not applied for the descriptive study.

Results:

Out of 50 patients majority of them i.e. 82% were in the age group of 20-35, 14% were between 35-60 years of age group while only 4% were above 50 years.

In 56% of the patients the duration of marriage was between 1-5 years, in 26% duration was 6-10 years and in 18% the duration of arriage was between 11-20 years. Out of the 50 patients, 58% ere smoker, 6% were addicted to alcohol and 6% to tobacco chewing.

Out of 50 patients 4% of the patient had semen volume less than 2ml, while the rest had normal volume. Only one patient had pH less than 7.2. 92% of the patients had liqueficaiton time of semen between 11-30 minutes and 8% had more than 30 minutes.(Table 1)

In 12% there was azoospermia, in 32% there was oligoospermia out of which 8% had mild to moderate and 12% had severe oligoospermia.

The motility was abnormal in 32% and in 26% they have altered morphology. (Table No.2) 8% showed the presence white blood-cells more than normal.

In this study 16% had left sided varicocele and 4% had right sided.

In this study 2% had the problem of impotency, 2% had the problem of premature ejaculation, 2% had history of herniorrhaphy, 6% had the history of mumps in childhood, 2% had diabetes mellitus.

Discussion:

The male factor infertility based on abnormal semen analysis accounts for 20% to 35% in various centers and countries.⁸ the basic semen analysis measure semen volume, sperm count, motility morphology. In addition to measure pH, fructose and white blood cells. Masturbation is the ideal method for specimen collection. It usually results in a specimen that is complete and otherwise uncontaminated, if masturbation cannot be performed for semen physiological or religious reasons then a special non toxic condoms may be used.⁹ The usual period of abstinence in the study population is 2-3 days. Pajwani S. in their study observed that the period of abstinence had no significant effect on volume and sperm concentration but had a significant effect on sperm motility.¹⁰

The observation is in accordance with other study by Carlsence et al (in 1992) that the men

Table 1: Volume pH, liquefaction abnormalities in semen analysis (N=50)

Parameters	No. of Patients	Percentage
Volume 2 ml or More		
< 2 ml	3	6%
Normal	47	94%
pH Value (7.2 – 7.8)		
< 7	1	2%
Normal	49	98%
Liquefaction within 30 minutes		
11-30 Minutes	46	92%
> 30 Minutes	4	8%

Table 2: Sperm motility and morphological abnormalities in semen analysis (n=50)

Parameters	No. of Patients	Percentage
Motility (50% Forward Progress)		
Abnormal	16	32%
Normal	34	68%
Morphology (>30%)		
Abnormal	37	74%
Normal	13	26%

sperm concentration and mean sperm volume in normal have dropped substantially with in past 5 years due to pollution, and increased environmental toxins.¹¹ In another study by Harison et al in 1987 showed that there may be significant fluctuation in count, motility and morphology due to stress.¹²

82% of patients in my study was between 20-35 years. In a study it was shown that men can be fathered child in their eighties however in another study by G. Mereino et al, concluded that age contributed to decline sperm motility and morphology in men over the age of 40.¹³ The minimum age of 20 years of the patient shows a level of early marriage in our society which can be attributed to low literacy rate in Pakistan.

Marlin and his colleague noted 12% of the etiologies due to alcohol and drug¹⁴, but as our social and religious settings does not allowed alcohol so the results are not that comparable. G. Stutz concluded in his study in 2004 concluded that alcohol, tobacco, and aspirin use could have detrimental effect on seminal parameters and that men who wish to procreate should be warned about such effect.¹⁵ Prohit T. M. and his colleagues observed that smoking and tobacco chewing for longer period may change semen quality and on the semen analysis 62% had asoospermia while 46% had oligozoospermia and only 2% have 3 normal count.¹⁶

Semen analysis is most widely used test in the evaluation of male infertility. Azoospermia is the sever form of infertility and incidence is stated to be 12.32% in Pakistani population by Khan & his colleagues in study in 1992, which is comparable to my study. A study of Zimbabwe showed the incident of 24.3% while figure of USA and Scotland are quite low i.e. 10% and 70% respectively.

Various parameters may be abnormal. A useful guide to prognosis is that one factor abnormality tends to be associated with a better prognosis than a two factor which in turn is better than a three factors, abnormality (factors being count, motility and morphology).²²

Dickey et al. in his study suggested that initial sperm motility and initial total motile sperm count for the parameter most likely to effect the pregnancy success.²³ Burr et al. suggested that it was sperm morphology and not the number of the total motile sperm that effect the fertility most.²⁴ Shulman et al. reported that sperm motility was the major determinant of success²⁵ while Brasch et al. suggested that the main factor was total motile sperm count.²⁶

Nalkla K.P. in his study concluded that the sperm motility provide more accuration information than morphology (WHO & Tygerberg's criteria) during the fertility evaluation. Redefining reference concentration and morphology may significantly increases the importance of routine semen analysis.²⁷

Nalini. K. and his colleagues in their study observed that history of mumps in the past, and other chronic illnesses does impact on the male fertility.²⁸

Childhood inguinal herniorrhaphy can lead to the male infertility due to obstruction of the vas deferens.

Conclusion:

Male factor infertility represent around half of general problem of subfertility and is today great health and social problem in terms of both prevention and therapy.

Semen analysis is a basic laboratory study help in assessing male factor infertility. It is simple and non invasive and its by its different parameter gives an idea about the spermatogenesis and hormonal status of the patient. Abnormalities of the semen probably represents the most common cause of infertility.

The most common cause of infertility in men is low sperm count and low motility. The second common abnormality was the altered sperm morphology. Sperm count and motility are good predictor of fertility potential. However sperm morphology now receives maximum credit.

Analysis of semen characteristics can provided a

reasonable basis upon which to develop a strategy for maximizing the fertility of men.

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