

## PATTERN OF SEMINAL FLUID ANALYSIS IN A POPULATION OF SUB FERTILE MEN – A Sri Lankan Study



### Original Research Article

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### ABSTRACT

**S**ubfertility is a very common presentation in urological practice. A retrospective observational study was conducted by the Department of Surgery, Faculty of Medicine, University of Peradeniya, Sri Lanka to evaluate seminal fluid analysis findings in a group of subfertile men attending to urology and andrology clinics, Teaching Hospital, Peradeniya. In all the patients socio demographic characteristics and seminal fluid analyses findings were recorded. Seminal fluid analysis findings were reviewed with attention to volume, concentration, motility and morphology Seminal fluid analysis findings were compared with WHO standard lower reference values.

According to the results the study population consisted of 113 study subjects between 24 to 48 years. Mean age was 34.51±5.28 years. Of the study population, 86.6% (n=98) had abnormal seminal fluid analysis findings and 13.3% (n=15) had normal parameters. Of the study population, 25.7% (n=29) had low volume ejaculate while 74.3% (n=84) had normal volume ejaculate. Minimum volume was 0.5ml and maximum was 5ml with a mean of 2.26±1.14ml. Mean total sperm concentration was 15.61±33.18 ×10<sup>6</sup>/ml, mean progressive motility was 15.94±22.68% and mean value for normal forms was 39.65±44.52%. Abnormal sperm characteristics included single factor abnormalities 64.5% (n=73) of the single factor abnormalities commonest was azoospermia 44.2% (n=50) others included oligozoospermia 10.6% (n=12) and asthenozoospermia 9.7 % ( n=11). Of the study population 19.5% (n=22) Showed combined abnormalities. Combined abnormalities included oligoasthenozoospermia 11.5 % ( n=13) and oligoasthenoteratozoospermia 8 % ( n=9). As a conclusion seminal fluid analysis plays an important role in assessment of male subfertility. This study shows a higher rate and variety of seminal fluid abnormalities in sub fertile patients.

### Index terms-

Subfertility,  
 Seminal fluid analysis,  
 sperm concentration,  
 single factor abnormalities

**I. INTRODUCTION**

Subfertility is defined as a failure to conceive after one year of regular unprotected sexual intercourse. [1] It is a very common presentation in urological practice. Subfertility affects an estimated 15% of couples throughout the world. Male factors are found to be solely responsible for 20-30% of subfertility cases and contribute to 50% of cases overall. [2] Among the male factors responsible for subfertility hormonal factors, disorders of spermatogenesis and obstructive causes play a major role. [1] Timely and well planned investigations are necessary in the management of subfertility as it has major implications on an individual’s life. Seminal fluid analysis plays an important role in the assessment of male subfertility.

In majority of cases of male subfertility, the causes of abnormal semen parameters are unknown. However, some of the aetiologies are genital tract infections leading to obstructive azoospermia/oligozoospermia which includes, tuberculosis, gonococcal and Chlamydia infections. Bilateral viral orchitis especially after 12 years of age impair sperm parameters. Congenital abnormalities and chromosomal disorders also contribute to sperm abnormality. The role of varicocele is inconclusive. It occurs in 12% of normal men. However, studies showed that varicocelectomy improved sperm parameters. Tobacco, alcohol, cannabis, drugs and wearing of tight underwear are also implicated [3]

During the past three decades, several reports have suggested that the quality of semen in normal men is declining. [4] Auger, J et al conducted a study from 1973 through 1992 using 1351 healthy fertile men. They concluded that during the past 20 years, there has been a decline in the concentration and motility of sperm and in the percentage of morphologically normal spermatozoa in fertile men that is independent of the age of the men. [4]

Stewart Irvine et al conducted a study using 577 volunteer semen donors born between 1951 and 1973. According to results they concluded that semen quality is deteriorating, with a later year of birth being significantly associated with a reduced number of sperm in adult life. [5]

In a review done by Elisabeth C. et al found out that there has been a genuine decline in semen quality over the past 50 years. According to their results there has been a significant decline in mean sperm count from 113x 10<sup>6</sup>/ml in 1940 to 66x 10<sup>6</sup>/ml in 1990 among men without a history of infertility. And they found a significant decrease in mean seminal volume from 3.40 ml to 2.75 ml during the same period. [6]

Adeniji R.A. et al conducted a descriptive analysis using results of the seminal analysis of 824 male partners of infertile couples. They found out that, 27.3% of the subjects had abnormal semen analyses, with Asthenozoospermia being the most common of the disorders observed. 6.7% subjects of the study population had Azoospermia. The most common multiple factors abnormality in the study population was oligoasthenozoospermia [7]

A prospective study was conducted by Owolabi A.T. et al using male partners of subfertile couples in Ile-Ife, Nigeria. According to their results, the patterns of semen parameters noted in infertile males were oligozoospermia, teratozoospermia, asthenozoospermia, azoospermia, oligoteratozoospermia, oligoasthenozoospermia, oligoasthenoteratozoospermia and asthenoteratozoospermia. Among the age groups, age group 31-40 had a higher prevalence of oligozoospermia. [8]

The objective of the current study was to evaluate seminal fluid analysis findings in a group of subfertile men attending to urology and andrology clinics, Teaching Hospital, Peradeniya.

**II. MATERIALS AND METHOD**

This study was conducted as a retrospective observational study by the Department of Surgery, Faculty of Medicine, University of Peradeniya from January 2005 to February 2016. Male patients presented to urology and andrology clinics, Teaching Hospital Peradeniya with a history of subfertility were included to the study. In all the patients socio demographic characteristics and seminal fluid analyses findings were recorded. Seminal fluid analysis findings were reviewed with attention to volume, concentration, motility and morphology Seminal fluid analysis findings were compared with WHO standard lower reference values.

According to the 5<sup>th</sup> edition of WHO laboratory manual for the Examination and processing of human semen, the lower reference values for seminal fluid parameters are as follows [9]

- Volume -1.5 ml
- PH-7.2
- Total motility (PR + NP) - 40%
- Progressive motility (PR) - 32%
- Vitality (membrane-intact spermatozoa) -58%
- Sperm concentration - 15 × 10<sup>6</sup> spermatozoa per ml
- Total sperm number - 39 × 10<sup>6</sup> spermatozoa per ejaculate
- Normal forms - 4%

Abnormal sperm parameters were defined as follows:

- Asthenozoospermia-Percentage of progressively motile (PR) spermatozoa below the lower reference limit
- Asthenoteratozoospermia-Percentages of both progressively motile (PR) and morphologically normal spermatozoa below the lower reference limits
- Azoospermia-No spermatozoa in the ejaculate
- Normozoospermia-Total number of spermatozoa, and percentages of progressively motile (PR) and morphologically normal spermatozoa, equal to or above the lower reference limits
- Oligoasthenozoospermia-Total number of spermatozoa, and percentage of progressively motile (PR) spermatozoa, below the lower reference limits
- Oligoasthenoteratozoospermia-Total number of spermatozoa, and percentages of both progressively motile (PR) and morphologically normal spermatozoa, below the lower reference limits[13]

**III. RESULTS**

The study population consisted of 113 study subjects between 24 to 48 years.

**Table1.Socio demographic characteristics of the study population**

Age group	No	%
21-25	2	1.8
26-30	27	23.9
31-35	34	30.1
36-40	39	34.5
41-45	7	6.2
46-50	4	3.5
<b>Total</b>	<b>113</b>	<b>100</b>
Occupational category	No	%
Legislators, senior officials and managers	1	0.9
Professionals	7	6.2
Technicians and associate professionals	7	6.2
Clerks	9	8.0
Service workers and shop and market sales	12	10.6
Skilled agricultural and fishery workers	15	13.3
Craft and related workers	13	11.5
Plant and machine operators and assemblers	15	13.3
Elementary occupations	15	13.3
Armed forces occupations	19	16.8
<b>Total</b>	<b>113</b>	<b>100</b>

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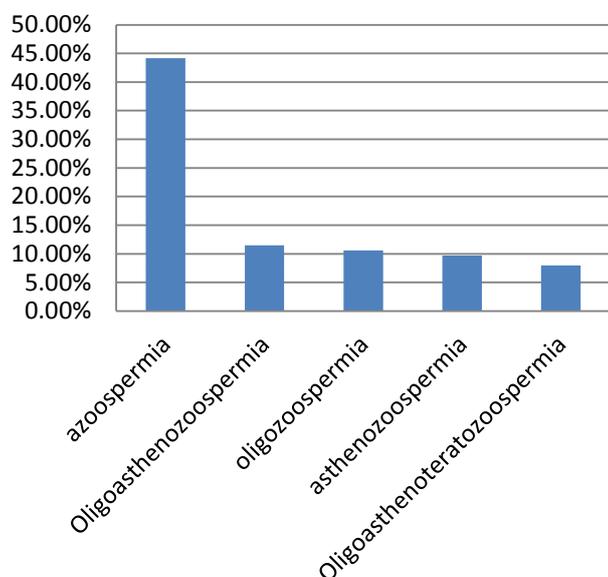
Mean age was 34.51±5.28 years. Of the study population, 86.6% (n=98) had abnormal seminal fluid analysis findings and 13.3% (n=15) had normal parameters.

Of the study population, 25.7% (n=29) had low volume ejaculate while 74.3% (n=84) had normal volume ejaculate. Minimum volume was 0.5ml maximum was 5ml with a mean of 2.26±1.14ml. Mean total sperm concentration was 15.61±33.18 ×10<sup>6</sup>/ml, mean progressive motility was 15.94±22.68% and mean value for normal forms was 39.65±44.52%.

**Table2. Seminal fluid analysis mean values of study population compared to WHO lower reference values**

	WHO lower reference values	Mean values of study population
Volume(ml)	1.5	2.26±1.14ml
Progressive motility (PR)	32%	15.94±22.68%
Sperm concentration	15 × 10 <sup>6</sup> spermatozoa per ml	15.61±33.18 ×10 <sup>6</sup> spermatozoa per ml
Normal forms	4%	39.65±44.52%

Abnormal sperm characteristics included single factor abnormalities 64.5% (n=73) of the single factor abnormalities commonest was azoospermia 44.2% (n=50) others included oligozoospermia 10.6% (n=12) and asthenozoospermia 9.7 % (n=11). Of the study population 19.5% (n=22) Showed combined abnormalities. Combined abnormalities included oligoasthenozoospermia 11.5 % (n=13) and oligoasthenoteratozoospermia 8 % (n=9).



**IV. DISCUSSION**

In our study population majority of the patients had abnormal seminal fluid analysis findings. The result of higher incidence of poor semen quality may be multi factorial such as genetic, life style and dietary practices and occupational exposures.

In a study conducted by Ugboma H.A.A et al, in Nigeria using 755 male partners attending to subfertility clinic, found out that 16.3% of the study population had normal sperm parameters. Compared to this in our study group, patients having normal seminal fluid analysis findings were lower. Of their study population 15.8% had oligozoospermia and azoospermia was seen in only in 2.6% of cases. In contrast in our study population higher percentage had azoospermia .[3]

Similarly in a study done by C.F.Chukwunyere et al. the commonest seminal fluid abnormality was oligozoospermia which accounted for 28% of the study population and azoospermia was only seen in 8%. In their study asthenozoospermia was seen in 25% of patients [10].Comparatively our study showed lower percentage of asthenozoospermia.

In a study conducted by Adeniji R.A. et al using 824 male partners of infertile couples the most common seminal fluid abnormality was asthenozoospermia which consisted of 27.8% of the study population. Only 6.7% of subjects had azoospermia. In their study most common multiple factor abnormality was oligoasthenozoospermia and three factor defects (Oligo/Astheno/Teratozoospermia) was seen in 13.1% of subjects [7].

In a study done by Chukwunyere C.F. et al low volume accounted for 12.6% of their study population. [10] In a retrospective descriptive study done by Prince Pascal Hounnasso et al the seminal fluid analysis revealed hypospermia in 30.1% of cases. In their study azoospermia in 33.7%, asthenozoospermia in 75.5% and teratozoospermia in 61.5%. [11]

In a retrospective descriptive study done by Prince Pascal Hounnasso et al the seminal fluid analysis revealed hypospermia in 30.1% of cases, azoospermia in 33.7%, asthenozoospermia in 75.5% and teratozoospermia in 61.5%. [11]

A retrospective study done by A.Igwegbe and J.Ugboaja using 348 semen samples of male partners of infertile couples in Nnewi Nigeria between 1st January 2006 and 31st December 2006. In their study 237 (68.0%) had semen fluid abnormalities. 104 (30.0%) had single factor abnormalities while 133 (38.0%) had combined factor anomalies. Asthenozoospermia 58 (16.7%) was the main single abnormality, while Astheno-oligozoospermia 51 (14.7%) and Astheno-oligoteratozoospermia (13.2%) were the major combined factor abnormalities detected. Very few 5 (1.4%) of the patients had azospermia. [12]

In a prospective study conducted by Willem Ombelet et al on Semen parameters in a fertile versus subfertile population to compare fertile and subfertile population, using 144 fertile subjects and 143 subfertile subjects’ azoospermia was observed in 4.9% men in the subfertile group. In both groups mean seminal fluid volume was 3.1ml. [3]

Various semen quality disorders responsible for subfertility such as azoospermia, oligozoospermia, asthenozoospermia, oligoasthenozoospermia, and oligoasthenoteratozoospermia are found to be major contributory factors to male subfertility in our study population. Among the abnormal seminal fluid analysis findings commonest was azoospermia. The high incidence of azoospermia may be due to obstruction of the genital tract from infection which is common in tropical environment. [3]

**V. CONCLUSION**

Seminal fluid analysis plays an important role in assessment of male subfertility. This study shows a higher rate and variety of seminal fluid abnormalities in sub fertile patients. People who are occupied in Armed forces seem to be having a higher incidence of subfertility.

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## REFERENCES

- [1] **Alison Taylor " ABC of subfertility Extent of the problem: " BMJ 327.7424 (2003): 1165-a-1165**
- [2] **Agarwal, A., Mulgund, A., Hamada, A. and Chyatte, M. (2015).** A unique view on male infertility around the globe. *Reprod Biol Endocrinol*, 13(1).
- [3] **Ugboma H.A.A, Obuna J.A. and Ugboma E.W. (2012).** Pattern of Seminal Fluid Analysis among Infertile Couples in a Secondary Health Facility in South-Eastern Nigeria. *Research in Obstetrics and Gynecology*, 1(2), pp.15-18.
- [4] **Auger, J., Kunstmann, J., Czyglik, F. and Jouannet, P. (1995).** Decline in Semen Quality among Fertile Men in Paris during the Past 20 Years. *New England Journal of Medicine*, 332(5), pp.281-285.
- [5] **Irvine, S., Cawood, E., Richardson, D., MacDonald, E. and Aitken, J. (1996).** Evidence of deteriorating semen quality in the United Kingdom: birth cohort study in 577 men in Scotland over 11 years. *BMJ*, 312(7029), pp.467-471.
- [6] **Carlsen, E., Giwercman, A., Keiding, N. and Skakkebaek, N. (1992).** Evidence for decreasing quality of semen during past 50 years. *BMJ*, 305(6854), pp.609-613.
- [7] **Adeniji, R., Olayemi, O., Okunlola, M. and Aimakhu, C. (2003).** Pattern of semen analysis of male partners of infertile couples at the University College Hospital, Ibadan. *West African Journal of Medicine*, 22(3), pp. 243-248
- [8] **Owolabi, A., Fasubaa, O. and Ogunniyi, S. (2013).** Semen quality of male partners of infertile couples in Ile-Ife, Nigeria. *Nigerian Journal of Clinical Practice*, 16(1), p.37
- [9] **WHO laboratory manual for the Examination and processing of human semen. (2010).** 5th ed. Switzerland: WHO press, World Health Organization, 20 Avenue Appia, 1211 Geneva 27 pp.7-113.
- [10] **Chukwunyere C. F, Awonuga D. O, Ogo C. N, Nwadike V, Chukwunyere K. E(2015).** Patterns of seminal fluid analysis in male partners of infertile couples attending gynaecology clinic at federal medical centre, Abeokuta. *Nigerian Journal of Medicine*, 24(2), pp131-6.
- [11] **Yde Soumanou, F., Hounnasso, P., Avakoudjo, J., Dankoro, A., Natchagé, G., Agounké, M. and Toré, R. (2015).** Male infertility: diagnostic and epidemiological aspect concerning 96 cases in a teaching university hospital of cotonou, benin republic. *Niger J Surg Res*, 16(1), p.20.
- [12] **Igwegbe, A. and Ugboaja, J. (2010).** Pattern of seminal fluid abnormalities in male partners of infertile couples in southeastern Nigeria. *Port Harcourt Medical Journal*, 4(3).
- [13] **O'Flynn, N. (2013).** Assessment and treatment for people with fertility problems: NICE guideline. *British Journal of General Practice*, 64(618), pp.50-51.

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