

Semen Parameters for Sudanese Attending an Infertility Clinic

Eltayeb Tayrab¹, Badawi S. Badawi², Hosam Aldeen S.M.Saeed³, Musa H.A⁴.

¹Department of Chemical Pathology, National Riabt University, Faculty of Medical Laboratory Sciences, Khartoum, Sudan.

²Department of Andrology, Reproductive Health Care Centre, Khartoum Sudan.

³Department of Basic Medical Sciences, Faculty of Pharmacy, Khartoum University, Sudan.

⁴Department of Medical Microbiology, National Riabt University, Faculty of Medicine, Khartoum, Sudan.

Abstract

Objectives: This is a descriptive laboratory based study done during 2007 to 2011 to assess the seminal profile of infertile men.

Subjects and Methods: One thousand and thirty seven Sudanese men attending Reproductive Health Care Center in Khartoum, Sudan were included. All of them presented with primary infertility for more than one year after marriage. Semen samples were collected after three to five days of sexual abstinence. Physical, macroscopic and microscopic examination of the semen was done as recommended by the World Health Organization (WHO). Sperms were stained using Rapi-Diff II and graded on the basis of the WHO criteria.

Results: 69.9% of the specimens showed normal parameters. The detected abnormal findings include; 27% showed elements of teratozoospermia, 8.4% azoospermia, 21.7% oligozoospermia, 0.4% hyperspermia, 11.2% hypospermia, 19.2% hyperviscosity, 6.1% sperm agglutination and 19.2% showed leucocytospermia.

Conclusion: Azoospermia was counted 8.4% of the studied population as a definite cause of infertility.

Keywords: semen analysis, infertility, azoospermia, oligozoospermia, hypospermia, leucocytospermia, Sudan.

Corresponding author: Eltayeb Mohamed Ahmed Tayrab, Assistant professor of chemical pathology, Faculty of Medical Laboratory Sciences, the National Ribat University: P.O. Box 55, Fax 83-263590. Phone: 00249912278825
E. mail: eltayebtayrab@Gmail.com.

Introduction

The analysis of semen is one of the important parameters of gonadal function. A normal semen is practically a guarantee of normal androgenicity. Inadequacies on the male's part contribute to a significant percentage of infertility problems ⁽¹⁾. Since semen analysis is simple to perform, it is often requested before complicated and expensive examination of the female partner.

The World Health Organization (WHO) provided guidelines for assessing the various semen variables.

Semen parameters obtained at different laboratories even in the same country are not directly comparable ⁽²⁾. In North European countries, a significant difference in semen quality among young men has been shown. Men from the western countries have lower semen quality than men from the eastern countries ⁽³⁾.

Sperm concentration which is expressed as millions per ml, or as millions per ejaculate, indicates the total number of the sperms found in that sample.

It was found that sperm number in the ejaculate is also dependent on the ethnic factors ^(4,5). In a Nigerian study; azoospermic were found to be 19.3% ⁽⁶⁾. In Kurnool and Jodhpur in India, azoospermia was detected among infertile men in a very high percentage (38.3% and 37.4%), respectively ⁽⁷⁾. Parameters like oligozoospermia and others are also dependent on the ethnic background ⁽⁵⁾. Data about infertile men in Sudan are very few. This study aimed to assess the seminal parameters of the male partners among infertile Sudanese couples.

Material and method:

This is a descriptive laboratory based study; carried out during the period 2007 to 2011 at the Reproductive Health Care Center-Khartoum –Sudan as the main reproductive clinic in Khartoum. One thousand thirty seven (1037) semen samples were collected from all men attending the clinic as infertile couples. The age range of the candidates was from 21-55 years. All semen samples were collected and analyzed by the researchers after instructions of proper collection; including 3-5 days sexual abstinence. The World Health Organization (WHO) guidelines for laboratory examination of the semen samples were followed. Different parameters of the semen were studied including physical, macroscopic

and microscopic examination. The parameters covered semen volume, PH reaction, viscosity, liquefaction time, sperm concentration, motility, morphology, agglutination and cellular contents particularly the leucocytes. Sperms were stained by Rapi-Diff II (Bios Europe Ltd II – Lancashire) ⁸ and graded on the basis of WHO criteria 2010. For severe oligozoospermic samples, centrifugation was done, and then smears were prepared, air dried and stained by Rapi-Diff II stain. Their morphology was scored using the criteria in CASA (WELY 900). For cryptospermic and suspected azoospermic samples, centrifugation was done at 3000 rpm for 5 minutes, then the supernatant was discarded and the belt was examined thoroughly for the presence of any sperm. The data were analyzed by using the package for social studies (SPSS 14.0).

Results:

Out of the 1037 semen samples 725 (69.9%) were normospermic, 225 (21.7%) oligozoospermic and 87 (8.4%) azoospermic (table 1).

Nine hundred and seventeen (917=88.4 %) of the studied population had normal semen volume, 116 (11.2%) showed hypospermia and 4 (0.4%) hyperspermia (fig. 1).

Abnormal parameters like teratozoospermia, sperm agglutination, hyperviscosity and leucocytospermia were detected by the percentages 27%, 6.1%, 19.2% and 19.2% respectively (table 2).

Table (1): The percentages of sperm concentration and motility in the study population

Parameter	Sperm concentration	Sperm Motility
Normospermia	(725) 69.9%	(492) 51.8%
Oligozoospermia	(225) 21.7%	(458) 48.2% (asthenospermia)
Azoospermia	(87) 8.4%	0 (0%)
Total	1037 (100%)	1037 (100%)

Percentages

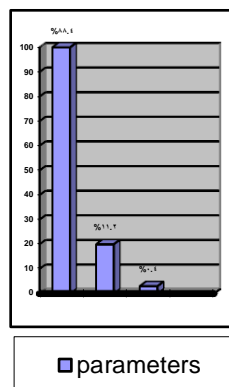


Fig.1:Semen volumes and percentages among the study population

Table (2): Sperm morphology, semen agglutination, viscosity and leucospermia in the study population

Parameter	Total number	Percentage
Sperm morphology	(n=1000)	
Semen with normal sperm morphology	730	73%
Teratozoospermia	270	27%
Sperm agglutination	(n=1037)	
Semen with no agglutination sperm	974	93.9%
Sperm agglutination	63	6.1%
Semen viscosity	(n=589)	
Normal viscosity	476	80.8%
Hyperviscosity	113	19.2%
Semen leucocytes	(n=1037)	
Non leucocytospermic	838	80.8%
Leucocytospermic	199	19.2%

Discussion:

The presence of suitable number of sperms with active motility and acceptable abnormalities in the morphology, viscosity,

round cells and absence of agglutination, is a good sign for a man to be fertile.

Azoospermia is increased dramatically during the last few decades ⁽⁹⁾. In this study the percentage of azoospermia

was found to be 8.4%. This finding was higher than what was reported by Lu and co-workers⁽¹⁰⁾, who found a percentage of 4.9%.⁽¹¹⁾ reported azoospermia among infertile men in the United States to be approximately 10-15%. In a Nigerian study azoospermia among infertile couples was detected to be 19.3% as written by⁽⁶⁾. It was much higher by a more recent study reaching 70 % in⁽¹²⁾. In India azoospermia reports were extremely higher 38.3% of infertile men as reported by⁽⁷⁾.

Oligozoospermia, among infertile Sudanese men was 21.7%. This percentage was significantly lower than what is reported in India and Nigeria, where the percentage was above 51% and 33.1% respectively⁽⁷⁾,⁽¹³⁾.

In this study hypospermia was detected in 11.2% of the infertile men and hyperspermia was 0.4%. In Nigeria Onyeka et al (2012) reported hypospermia to be 31.6% and hyperspermia 2.3%.

It is well known that leucocytes are the predominant source of reactive oxygen species which negatively influence the functions of the sperms and their fertilizing capability as said by⁽¹⁴⁾. In the current study the presence of leucocytospermia was 19.2% of the tested candidates. The presence of leucocytes could be due to infection or inflammatory reaction which might affect the sperms activity. A lower percentage (12.8%) was reported by Adetayo and Osegbe (2005)⁽⁶⁾.

Conclusion:

Azoospermia, as a definite cause of infertility represents 8.4% of the male partners in this study. Other abnormal semen parameters may play a significant role in male infertility. Since semen analysis is easy to perform, search for abnormalities should be investigated early in any infertile couple. We recommend conducting more research on this field to clarify the real causes of infertility in the region.

References:

1. Patton, P. E., and Battaglia, D. E. (2005). *Office andrology*. Humana Press, Totowa. New York. P: 18-20.
2. WHO laboratory manual for the examination of human semen and sperm cervical mucus interaction. 4th edn. Cambridge University Press. 1999.
3. Fernandez, M. F. , Duran, I., Olea, N., et al. (2012). Semen quality and reproductive hormone levels in men from Southern Spain. *Intenational journal for andrology*. 35(1), P: 1-10.
4. Merzenich. H., Zeeb, H., Blettner, M. (2010). Decreasing sperm quality: a global problem?. *BMC Public Health*, P: 10-24.
5. Tsarev, I., Gagnin, V., Giwercman, A., Erenpreiss, J. (2005). Sperm concentration in Latvian military conscripts as compared with other countries in the Nordic-Baltic area. *International journal of andrology*, 28(4), P: 208-214.
6. Adetayo, F.O., Osegbe, D. N. (2005). Semen Parameters in Infertile Nigerian Males: A critical Study. *Nigerian Quarterly Journal of Hospital Medicine*, 15(2). P: 87-91.
7. Elia, J., Delfino, M., Imbrogno, N., et al. (2009). Human semen hyperviscosity: prevalence, pathogenesis and therapeutic aspects. *Asian Journal of Andrology* 11, P: 609-615.
8. Bio Europe Ltd. Skelmersdale, Lancashire, WN8 9PS, U.K. (1988)
9. U.K. regulatory information. The control of substances hazardous to health regulations. Accessed at: www.bio-europe.com.
10. Daniel, H. W. (2010). Sperm banking and the cancer patient. *Ther Adv Urol*. February; 2(1). P: 19-34.
11. Lu, H., Shi, W. B., Liu, Y., et al. (2012). Reference values of semen parameters for normal fertile men in Shanghai. *Zhonghua Nan Ke Xue*. ;18 (5). P: 400-403.
12. Stephen, E. H., Chandra, A. (2006). Declining estimate of infertility in United States: 1982-2002. *Fertil Steril*. 86. P: 516-523.
13. Ugwuja, E. I., Ugwu, N. C., Ejikeme, B. N. (2008). Prevalence of low sperm count and abnormal semen parameters in male partners of women consulting at infertility clinic in Abakaliki, Nigeria. *Reproductive Health*, 12 (1). P: 67-73.

14. Onyeka, C. A., Ashiru, O. A., Duru, F. I., Olorunfemi, O. J., Fabunmi, O. O., Oluwatuyi, T. S. (2012). Semen analysis of 263 sample men from infertility clinic in Western Negeria. West Africa journal of assisted reproduction.

Accessed at: <http://wajar.info/archive.html>. P:1-16.

15. Giuseppe, R., Sandra, P., Rita, B., et al. (2009). Leukocytospermia and sperm preparation- a flow cytometric study. Reprod biol and endocrinol, 7(12). P: 2-10.