SEMEN ANALYSIS OF 263 SAMPLE MEN FROM INFERTILITY CLINIC IN WESTERN NIGERIA

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ABSTRACT

Objectives: Study was carried out to determine the incidence of male infertility in Medical Art Center, Maryland Ikeja Lagos, Western. Nigeria.

Method: The specimens were collected and analyzed in the andrology laboratory. The standard method of masturbation after 3-5 days of prior abstinence from sex before sample collection was applied. The samples were examined for semen volume, morphology, sperm motility and count.

Result: The semen samples of 263 (two hundred and sixty three) males attending infertility clinic, aged between 30-65 years and above were collected and analyzed. The results showed that 66.2% had normal seminal volume while 31.6% were hypospermia and 2.3% were hyperspermia. 33.8% showed abnormal morphology. Motility abnormalities were 46.8%. In the sperm count, only 60.5% had normal cells, 33.1% were oligozoospermic while 6.5% were azoospermic.

Conclusion: It can be concluded from our findings that abnormal semen quality remains a significant contribution to overall infertility in our environment and the male are coming to terms that they could also be a contributory factor. There is need to identify the causative factors and in cases in which therapeutic recovery cannot be achieved, artificial insemination should be encouraged.

Key Words: Infertility, Males, Western Nigeria, Semen Analysis

INTRODUCTION

The field of human reproduction has become a dynamic area of research for physicians and social scientist in the world. However, advances in the study of sperm cell function and dysfunction has led to an increasing understanding of the role in male infertility relationships (1). Infertility affects approximately 15% of couples of reproductive age, and with nearly half of these cases resulting from male factor infertility (2). A male factor is responsible in Iran for about 50.5% (3) which was similar to (4) study in southeast part of Nigeria (42.4%) while the frequency of male factor was 26.8% in (5) study, 21% in South Africa (6) and 36.8% in (7) study in Iraq. Although the semen analysis is a test of fertility but not the sole test of fertility, however it is the important single indicator of the functional status in the male reproductive tract. With the increase in awareness of the role of the male factor in infertility (8) especially in Africa (9) there is need for emerging modalities in assisted reproductive technology to manage them (10). In this regard, seminal fluid analysis, though not foolproof remains an indispensable diagnostic tool in the evaluation of the fertility potential of these male partners (11). The methodology for semen analysis has been undergoing constant improvement, and new assessment criteria have been proposed (12). Various factors may be associated with the variation in sperm characteristics among male individuals; these include the length of sexual abstinence preceding the collection of sperm for analysis and are an important variable for the quality of the results (13). Male infertility is not a single entity but presents a variety of different pathogenetic mechanisms, which result primarily from low concentrations of sperm cells in semen (low sperm count), abnormal spermatozoa to abnormal sperm function (1). There are five main factors that contribute to overall sperm quality. They include sperm motility, speed (motility), count, concentration and morphology (shape and size). A weakness in any of these areas can affect the chances of conception.

This study was therefore carried out to examine the seminal fluid of the male partners of fertile and infertile couples seen in the fertility clinic in an urban and cosmopolitan setting, using the standardized guidelines according to World Health Organization procedure (14), with a view to determining the prevalence.

MATERIALS AND METHODS

The study was approved by the Research and Ethnical Committee of the Clinic, and informed consent was obtained from all patients. Couples may present at the clinics for problems relating to either male or female fertility problems (or both), the study population includes fertile men with a range of fertility problems. In this observational study, we examined 263 men attending an infertility clinic from February 2008 to February 2010. The age of the study population was 30-65. Semen samples were collected by masturbation in a sterile wide-mouthed calibrated container after an abstinence period of 3- 5 days. Semen analysis was performed by andrology technicians following the World Health Organization protocol (14), to evaluate the sperm parameters: sperm volume, sperm morphology, sperm motility, sperm count. The results obtained were pooled together and were analyzed using SPSS 17. From the number of specimens, the frequency, percentages, mean and standard deviation were worked out and recorded. Comparisons of means were done using ANOVA and student unpaired t–test, and p value less than 0.05 is considered significant.

RESULTS

Results of seminal fluid samples collected from 263 males were analyzed. Demographic characteristics of the subjects are shown on **Table I.** Most of the respondents belong to the 30-65 age range. The mean age of the subject was 42.13 years. Most subjects were Christians 215 (81.8%), while Muslim 48 (18.3%) and 90.5% had tertiary education. There were mainly private company employees 175 (66.5%), self employed were 65 (24.7%) and Government employed 23 (8.75%). About 184 respondents (70%) had previously achieved pregnancy with any female while 79 subjects (30%) claimed never to have done so. **Table II** revealed that majority of the subjects 66.2% (2.70±0.96) had adequate semen volume, while 33.8% had abnormal semen volume of which 31.6% (0.96±0.27) hypospermia and 2.3% (8.07±1.93) hyperspermia. There was a significant difference ($p<0.05$) in hypospermia and hyperspermia when statistically compared with normospermic. **Table III** shows that 33.8% (12.12±9.05) of the subjects had abnormal morphology of their sperm cells, while 66.2% (55.67± 12.9) of the subjects had sperm cells with normal morphology; there was a significant difference ($p<0.05$) in abnormal morphology when compared with normal morphology. **Table IV** showed significant difference ($p<0.05$) in sperm cells of normal motility 53.2% (64.81±11.52) when compared with the males that had less than 50% sperm motility 46.8% (26.18±17.05). There was a significant difference ($p<0.05$) between normal sperm count 60.5% (72.80± 34.42), oligozoospermic 33.1% (7.34±6.0) and azoospermia 6.5% (0.00±0.0001) in **table V**.

Table I

Demographic data of study subjects who had seminal fluid analysis

Parameters	Frequency	Percentage (%)
Age (Years)		
31-35	24	9.13
36-40	75	28.5
41-45	104	39.5
46-50	46	17.5
>50	14	5.32

Religion		
Christian	215	81.8
Muslim	48	18.3
Occupational setting		
Government employed	23	8.75
Private company employed	175	66.5
Self- employed	65	24.7
Educational background		
Primary education	-	-
Secondary education	25	9.51
Post- secondary education	238	90.5
Distribution of infertility		
Primary infertility	79	30.0
Secondary infertility	184	70.0

Table II: Semen Volume

Semen volume (cm^3)	Frequency	(%)	Mean ± SD
0.1-1.4	83	31.55	0.95 ± 0.27*
1.5-5.9	174	66.16	2.70 ± 0.96
6.0-10.9	6	2.28	8.07 ± 1.93*
Total	263	99.99	

**The mean difference is significant at p<0.05*

Table III: Sperm morphology

Sperm morphology	Frequency	(%)	Mean ± SD
0-29	89	33.84	12.12 ± 9.05*
30-89	174	66.16	55.67 ± 12.9
Total	263	100	

**The mean difference is significant at p<0.05*

Table IV: Sperm motility

Sperm motility (%)	Frequency	(%)	Mean ± SD
0-49	123	46.77	26.18 ± 17.05*
50-119	140	53.23	64.81 ± 11.52
Total	263	100	

**The mean difference is significant at p<0.05*

Table V: Sperm count

Sperm count (10^6/ml)	Frequency	(%)	Mean ± SD
00	17	6.46	0.00 ± 0.001*
0.1-19	87	33.08	7.34 ± 5.959*
20-179	159	60.46	72.80 ± 34.42
Total	263	100	

**The mean difference is significant at p<0.05*

DISCUSSION

It is a common knowledge that in our environment as in many other developing countries, the male shies away from the responsibility of infertility, pointing accusing finger on the female. The high degree of involvement of age 36-45 years in this study is noted, this is a pointed that the male has woken up to the task that they could also be a contributing factor to infertility.

In the present study it was observed that the volume of normal seminal fluid was 66.2%, hypospermia was 31.6% and hyperspermia 2.3% while the study from Enugu Eastern part of Nigeria (15) reported volume of normal seminal fluid as 91%, hypospermia was 7.3% and hyperspermia 1.7%. The adequate semen volume may be as a result of the 3-5 days sexual abstinence adopted in this study as recommended by (16). Our abnormal value of 33.8% is lower than the established normal percentage morphology recommended by W.H.O 1987 (17) of 50% and the 45% by (16). The specific type of abnormality in the morphology of the sperm cells were not recorded; however (16) reported that morphology results could be affected by staining techniques, subjectivity of observation and the definition of the sperm malfunction. Hence, it may not be a good prediction of the fertility potential of a given semen sample. However available literature shows that only 23.3% were found to be abnormal in the study from Ibadan (8) and contrasts significantly with our findings and 62% from Enugu, Eastern part of Nigeria (15). Sperm motility has been found to have a much stronger relationship to both percentage of pregnancy and conception rate when compared to sperm concentration (8). However, sperm motility is susceptible to variations resulting from collection methodology such that prolonged abstinence before collection is associated with increase in sperm concentration while more frequent ejaculation may increase motility but lead to associated low sperm density (18). The reduced motility of 46.8% in this study is higher than 24.9% obtained earlier by another study (11); this figure is in sharp contrast with (15) who recorded 93.7%. In our study, sperm disturbance (39.6%) such as oligospermia, azoospermia were one of the common etiologic factors responsible for male infertility which is in accordance with (3) 40.3% in Iran. The oligospermia (33.1%) recorded in this study is very significantly higher than that reported by (11) 15.4%. The azoospermia found in this study compares favorably with a similar study 6.7% by (8), but was higher in Maiduguri in northern Nigeria where 75% was reported (19). Results of semen analysis shows that in Ile- Ife in southwest part of Nigeria, 12.3% were azoospermia, 36.0% oligospermia, 51% normal (20) while 23.4% azoospermia,

48.9% oligospermia, 27.6% normal was reported in Ilorin (21). However, a study in Sudan showed 89.7% normal, 65.9% abnormal morphology, 37.1% azoospermia, and 13.4% oligospermia (22). The decrease in sperm count, motility and morphology is related to dietary, environmental, infectious, genetic factors, all these can contribute to infertility; however these factors can produce sub fertility, which may not ultimately prevent conception or may subside it (23). The protocol for this study did not include the above stated factors and cannot comment on it.

CONCLUSION/ RECOMMENDATION

It can be concluded from our findings that abnormal semen quality remains a significant contribution to overall infertility in our environment. Not all cases of infertility can be prevented but dietary and lifestyle changes may be helpful. There is need to identify the causative factors and in cases in which therapeutic recovery cannot be achieved, Assisted Reproductive Techniques treatment modalities should be encouraged since not all can be treated with artificial insemination.

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