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Semen Quality in Male Partners of Infertile Couples in Lagos Nigeria

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Abstract: This descriptive study was conducted from January-December 2008 to examine the seminal fluid of the male partners of infertile couples seen in the gynaecology clinic of a tertiary hospital in an urban setting, with a view to determining the prevalence and types of gross abnormalities. All couples who presented for infertility management were counselled and the male partners who consented were recruited. The subjects were requested to collect semen samples by masturbation and these were analysed and the findings were documented. Motility abnormalities (astenozoospermia) were the most common disorders among the study population with 87 (24.9%) in this category, 3.1% were azoospermic while 15.4% were oligozoospermic. Teratozoospermia was seen in 4.3% of the subjects. Some of the abnormal seminal samples demonstrated combined defects with oligo-asthenospermia occurring in 10% of the entire study population. More than two thirds of male partners of infertile couples in this study had some degree of seminal fluid abnormality. The practitioner should therefore endeavour to involve them early in the overall management in order to mitigate the grievous socio cultural impact on the women and commence appropriate investigation and definitive therapy.

Key words: Semen, infertile, masturbation, microscopy, asthenozoospermia, teratospermia

INTRODUCTION

Issues about reproduction and fertility are core to the survival of the human race and have pre occupied humanity since recorded history (Bhasin, 2007). Infertility is defined as the inability of a couple to achieve pregnancy after one full year of regular unprotected intercourse (Bhasin, 2007; Hammond and Stillman, 1999) though demographers have advocated a less constrictive definition (Larsen, 2000). Globally, infertility affects at least about one couple in six and the commonest single defined cause is sperm dysfunction (Bhasin, 2007; Irvine, 1996). The prevalence of infertility in Sub-Sahara Africa is as high as 30% and the male contribution in most countries including Nigeria had been variously estimated to be between 30 and 50% (Imade *et al*., 2000; Adeniji *et al*., 2003).

Most health advocates in Nigeria regard infertility as the most important reproductive health and social issue confronting Nigerian women. Nigerian gynaecologists have frequently reported a prevalence of infertility ranging from 60-70% of their consultations in tertiary institutions (Okonofua *et al*., 1997).

The socio-cultural milieu in Sub-Saharan Africa with the exaggerated emphasis on childbearing puts so much stress on couples that invariably culprits are sought and marital relationships suffer as the female partner often bears the brunt (Pearce, 1999; Dyer *et al*., 2004). With the increase in awareness of the role of the male factor in infertility (Irvine, 1996; Adeniji *et al*., 2003) especially in Africa (Larsen, 2000) and the emerging modalities in assisted reproductive technology to manage them (Bhasin, 2007), more male partners amongst infertile couples are submitting themselves to investigations for infertility. 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.

This study was therefore carried out to examine the seminal fluid of the male partners of infertile couples seen in the gynaecology clinic of a tertiary hospital in an urban and cosmopolitan setting, using the standardised guidelines from World Health Organization laboratory manual (WHO, 1992) with a view to determining the prevalence and types of gross abnormalities.

MATERIALS AND METHODS

This descriptive study was conducted from January-December 2008 at the Research Laboratory of the Gynaecology department of the Lagos State University Teaching Hospital. Ethical approval was sought for and

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obtained from the Research and Ethics Committee of the hospital. All couples who presented for infertility management were counselled and only those who consented were recruited. Relevant history of the subjects such as age, previous history of achieving pregnancy with any female and duration of infertility was extracted from the case notes of the couple.

The subjects were requested to abstain from sexual intercourse for three days before sample collection. Sterile universal plastic containers were provided for semen collection. The samples were produced by masturbation in a side room within the hospital. They were analysed within 1 h of collection or as soon as liquefaction occurred using the manual method.

Initial macroscopic examination of the appearance, viscosity and volume estimation was done, after which microscopy was employed to assess sperm concentratration, motility, mean progressive motility and morphology according to the WHO (1992) guideline.

Normospermia refers to a sample with spermatozoa concentration greater than or equal to 20 million mL^{-1}. Azoospermia refers to absence of spermatozoa in the ejaculate and oligospermia when sperm concentration is <20 million mL^{-1}. Progressive forward motility of <50% denotes asthenozoospermia while teratozoospermia refers to a situation where <30% of the spermatozoa present have normal morphology. The presence of white blood cells was also sought and where present were counted per field. The proportion of the samples showing abnormalities in spermatozoa counts, motility and morphology were calculated and recorded in simple percentages as appropriate.

RESULTS

A total of 350 semen samples from male partners of infertile couples were analysed for this study. About 260 subjects (75.7%) had previously achieved a pregnancy with any female while 85 subjects (24.3%) claimed never to have done so (Table 1).

The mean duration of infertility in the couples was found to be 4.25±3.63 years. Various abnormalities were detected in 242 samples (69.1%) while 108 samples (30.9%) were foundtobe grossly normal (Table 2). Table 3 shows the characteristics of the abnormal seminal samples. Motility abnormalities (astenozoospermia) were the most common disorders among the study population with 87 (24.9%) in this category, 3.1% were azoospermic while 15.4% were oligozoospermic. Teratozoospermia was shown in 4.3% of the subjects. Some of the abnormal seminal samples demonstrated combined defects with oligo-asthenospermia occurring in 10% of the entire study population. Leucocytes >5 per high power field were found in 14 samples (4%), while 25 samples (7.1%) had >5 other round cells per high power field.

Table 1: Distribution into Primary and Secondary infertility among the infertile couples

Infertility	Frequency	%
Primary infertility	85	24.3
Secondary infertility	265	75.7
Total	350	100.0

Table 2: Semen characteristics of study population

Type of Abnormality	Number	Proportion (%)
Normozoospermia	108	30.9
Abnormal semen quality	242	69.1

Table 3: Classification of Semen abnormalities

Semen abnormalities	Number	%
Single defects		
Azoospermia	11	3.1
Oligozoospermia	54	15.4
Asthenozoospermia	87	24.9
Teratozoospermia	15	4.3
Combined defects		
Astheno/Oligozoospermia	35	10.0
Oligo/Teratozoospermia	10	2.9
Asteno/Teratozoospermia	10	2.9
Oligo/Asteno/Teratozoospermia	20	5.7

DISCUSSION

This study demonstrated the presence of seminal fluid abnormalities in 242 (69.1%) of male partners of infertile couples studied. This finding was in keeping with earlier findings from studies in a central province of Nigeria (Imade *et al*., 2000) where 71% of samples analysed were abnormal and contrasts significantly with findings from another part of Nigeria where only 23.3% were found to be abnormal (Adeniji *et al*., 2003).

The preponderance of secondary infertility at 75.7% compared to primary infertility 24.3% amongst the male partners of infertile couples is in tandem with findings of other researchers in Sub Saharan Africa (Larsen, 2000; Adeniji *et al*., 2003).

Poor motility (asthenospermia), low sperm density (oligozoospermia)and a combination of both parameters (astheno-oligozoospermia) were the commonest sperm abnormalities encountered in this study at 24.9, 15.4 and 10%, respectively. The interpretation of seminal fluid analysis abnormalities serves at best as a guide because the fertility potential has not been found to be directly proportional to the gross appearance. In fact there had been surprising fertility in some men with poor counts and wide variations even in normal fertile men (Hammond and Stillman, 1999).

Sperm motility has been reported to have a much stronger relationship to both percentage of pregnancy and conception rate when compared to sperm concentration (Adeniji *et al*., 2003; Ayala *et al*., 1996). This is however susceptible to variations resulting from

sample 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 (Imade *et al*., 2000; Ayala *et al*., 1996).

The WHO (1992) standardized protocol for semen collection after three days abstinence was employed for this study (Rowe *et al*., 2000). Collection was by masturbation only as spillage of the first portion' the split ejaculate of the sample duringcoitus interruptus can yield unsatisfactory results. The finding of combined two factor abnormalities(astheno/oligozoospermia) and 3 factor combinations (Oligo-astheno/teratozoospermia) of 10 and 5.7% is lower than the reported values from other studies (Imade *et al*., 2000; Adeniji *et al*., 2003). The empirical significance of this is that the prognosis for fertility potential worsens with increasing combination of factors (Cooke, 1999). The presence of significant number of leucocytes and other round cells 4 and 7.14%, respectively was observed in this study. These might be indicators of the presence of infection and some inflammatory processes along the genital tract. Some researchers, following bacteriological studies, insist that there is a direct correlation between seminal infection, semen abnormalities and infertility (Emokpae *et al*., 2009). Others however postulated that the damaging effects of infections especially sexually transmitted disease on both the testes and the accessory organs lead to post inflammatory obstruction or secretion of Reactive Oxygen Species (ROS) which alter spermatozoa characteristics and functions (Irvine, 1996; Macleod, 1951; Ekwere, 1995). The protocol for this study did not include bacteriological examination of the various specimens and cannot comment on the presence or roles of pathogens.

CONCLUSION

In this study, it is obvious that more than two thirds of male partners of infertile couples in this study had some degree of seminal fluid abnormality. The practitioner should therefore endeavour to involve them in the overall management in order to mitigate the grievious socio cultural impact on the women (Dyer *et al*., 2004) and commence appropriate investigation and definitive therapy (Bhasin, 2007).

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