Male Factor Subfertility At The Imo State University Teaching Hospital, Orlu.

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Citation

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Abstract

Background: Infertility is a global problem with much socio-psychological burden and the male partner contributes substantially to this.

Aim; To determine the male contribution to subfertility at the Imo State University (IMSUTH) Orlu and to document the pattern of the abnormalities and to recommend appropriate interventions.

Methods: A six- year retrospective study of all the semen samples of male partners of infertile couples submitted for analysis to the Microbiology laboratory of IMSUTH Between June 2004 to June 2010.
The case records of the male partners of infertile couples with identifiable male factors were retrieved from the medical records department for detailed study.
Results: Nine hundred and ninety two (992) male patients had their semen analyzed. Four hundred and eighty one (48.5%) of them had one form of abnormality or the other in their seminal fluid. The patients were aged 22 – 47 years. Oligozoospermia (23.3%) and asthenozoospermia (9.1%) were the commonest single abnormalities encountered. No case of aspermia was seen. Staphylococcus aureus (46.9%), Klebsiella (34.9%) and Escherichia coli (13.4%) were the most frequently isolated organisms in the seminal fluid of the patients. Majority of the patients (55.5%) had no clinical finding on them.

Conclusion: The study showed a high rate of semen abnormalities among the male partners of infertile couples in our environment. The Genital tract infections contribute significantly to this highlighting the need for men to be part of programmes aimed at reducing genital tract infections in Nigeria. The cost of Assisted Reproduction at present is far beyond the reach of the average African.

INTRODUCTION

Infertility is a global problem with much socio-psychological burden for couples, especially in an environment such as ours where much premium is placed on procreation[1-3]. Infertility is not a disease entity but a symptom of an underlying pathology. It is therefore absolutely essential to identify the underlying pathology causing the infertility for an appropriate treatment(s) to be instituted. The male partner contributes significantly to this problem[4, 5]. For conception to occur, favourable female factors and healthy sperm cells of adequate number and motility deposited within the female reproductive system are parts of the pre-requisites. Therefore evaluation of the male factor should form part of the basic infertility work-up.

Semen analysis has been the gold standard in the assessment of the male factor in infertility[1,6]. Semen is best obtained for semen analysis by masturbation. At least three consecutive semen parameters two to three weeks apart are needed to make a diagnosis of an abnormal semen sample because of the known variability in the results of semen analysis. Azoospermia or severe oligozoospermia may result either from testicular failure or from obstruction of the seminiferous tubules or efferent ducts even with normal spermatogenesis occurring in the testes. In such situations, hormonal assay, which includes follicle stimulating hormone (FSH), Luteinising hormone (LH), testosterone and prolactin measurements are done to determine the aetiology of the problem. Testicular biopsy and vasography are also done when necessary, usually as a last resort.

With the reports of increasing contribution of the male

partner to cases of infertility in our environment which in most cases are underestimations, because the male ego does not allow them to easily submit their semen for analysis or to even volunteer the details of their sexual history leading to cases of erectile dysfunction and impotence being missed, there is need for periodic assessments of the contribution of the male partners to cases of infertility in our environment .This present study was carried out with such objective in mind.

MATERIALS

This retrospective study was carried out at the Imo State University Teaching Hospital, Orlu in the South-eastern region of Nigeria. In our centre, diagnostic work-up of an infertile couple involves interviewing both partners during the first visit. Even though the woman is usually the first to seek consultation, detailed explanations of the pre-requisites for normal conception usually assists in winning over the man's co-operation. The infertility clinic is run by a team comprising the gynaecologist, the urologist and the endocrinologist. A detailed history is obtained from both patners. The man is normally examined in privacy in a warm room completely undressed and in a standing position. A general physical examination is performed to detect abnormalities pertinent to fertility. This will usually include the size, position and consistency of the testes, the state of the vas deferens and epididyimis, presence of varicocoele, site of opening of the urethral meatus, and the condition of the prostrate gland.

Sterile wide mouthed specimen bottles are used for collecting semen for analysis. The patients are advised to abstain from sexual intercourse for at least 2 to3 days before semen collections. Masturbation is the method of choice for semen collections. Semen samples are either produced in a side room within the hospital or are collected at home and brought to the laboratory within one hour of production. An initial macroscopic examination of the semen sample for appearance, viscosity and measurement of volume are done. A wet preparation is made and examined under the microscope using the 40× microscope lens for motility and morphology of the sperm cells. The presence of leucocytes, other round cells and agglutination are also noted in the wet preparation. A sample of the semen diluted with 1% formalin in distilled water is then placed in a Neuber chamber for counting of the sperm cells. Routine biochemical analysis of the seminal fluid is not done.

The WHO guideline[7] is used to classify the various semen abnormalities identified. Azoospermia refers to the complete absence of spermatozoa in the ejaculate while aspermia implies the absence of semen in the ejaculate. Oligozoospermia refers to spermatozoa less than 20 million per ml. Teratozoospermia implies that more than or 30% of the spermatozoa have abnormal morphology while asthenozoospermia refers to a situation where less than or 50% of the spermatozoa are actively motile.

The diagnosis of chronic urethritis and male accessory gland infection was made based on a history and clinical findings of chronic or recurrent urethral discharge, dysuria, soft, tender and enlarged prostrate gland on rectal examination, epididymal thickening or nodularity and a palpable and/or tender seminal vesicles with numerous pus cells on semen microscopy and a positive culture result.

The case notes of the four hundred and eighty one patents with identifiable male factors contributing to infertility among the nine hundred and ninety two patients investigated for infertility at the Imo State University Teaching Hospital from June 2004 to June 2010 was retrieved from the medical records department for detailed study. The data obtained from the case notes included the patients' occupation, frequency of coitus, inflammatory and sexually transmitted diseases, congenital malformations affecting the reproductive organs, previous medical and surgical procedures especially a history of trauma to the groin, groin surgery and mumps orchitis. Others include the wearing of tight fitting underwears, exposure to heat, radiation and the use of illicit drugs such as alcohol, tobacco and marijiuana.

RESULTS

Nine hundred and ninety two (992) male patients had their semen analyzed as part of a comprehensive subfertility evaluation of couples presenting at IMSUTH between June 2004 and Jun 2010. Four hundred and eighty one (48.5%) of them had one form of abnormality or the other in their seminal fluid. Biochemical analysis of the semen is not done routinely in our centre. The patients were aged 22 to 47 years. The modal age range was 28-32 years, accounting for 51.2% of the cases. Fifty six percent of the patients gave a history of having a child with the present or a former partner.

Table 1 depicts the different semen abnormalities seen in the 481 males with abnormal seminal fluid analysis. Oligozoospermia (23.3%) and asthenozoospermia (9.1%) were the commonest single abnormalities encountered. No case of aspermia was encountered. Staphylococcus aureus (46.9%), Klebsiella (34.9%) and Escherichia coli (13.4%)

were the most frequently isolated organisms in the seminal fluid of the patients.

The major clinical abnormalities found in the man with abnormal semen profile are shown in table 2. Majority of the patients (55.5%) had no clinical finding on them.

Table 3 shows the results of the testicular biopsy of the 27 patients who had a testicular biopsy because of azoospermia or severe oligozoospermia. The fertility hormone profile of these patients showed either a normal or a high serum FSH and LH. Sperm outlet obstruction (48.1%) was the commonest histological abnormality seen in the testes of these men.

Figure 1

Table 1: Classification of semen Abnormalities

Type of Abnormality	Number of case N= 481	Percentage
Oligozoospermia	112	23.3
Oligo/tetrato/asthenozoospermia	76	15.8
Oligo/asthenozoospermia	73	15.2
Azoospermia	64	13.3
Asthenozoospermia	44	9.1
Oligo/tetratozoospermia	41	8.5
Tetratozoospermia	39	8.1
Tetrato/asthenozoospermia	32	6.7
Total	**481**	**100.0**

Figure 2

Table 2: Clinical Findings

Clinical finding	*Number of cases N=481	Percentage
No detectable pathology	267	55.5
Variococoele	67	13.9
Hemiorraphy	38	7.9
Hydrocoelectomy	33	6.9
Infection of the accessory gland	27	5.6
Chronic epididymo-orchitis	16	3.3
Groin trauma	14	2.9
Orchidopexy	9	1.9
Undescended testis	8	1.7
Gynaecomastia	7	1.5
Klinefelter's syndrome	6	1.2
Childhood mumps	5	1.0
Hypospadias	5	1.0

***Multiple Clinical findings in most cases**

Figure 3

Table 3: Testicular biopsy results

Testicular Histology	Number of case N=27	Percentage
Sperm outlet obstruction	13	48.1
Seminiferous tubular Hyalinization	5	18.5
Tubular Sclerosis	4	14.8
Germ cell Aplasia	3	11.1
Germ cell Arrest	2	7.4
Total	**27**	**100**

DISCUSSION

Subfertility is a global health problem[8]. Infertility is regarded as a curse in several cultures. However, with the advent of modern science, the causes of infertility are increasingly being better understood. Consequently, more and more people in these superstitious societies are now embracing orthodox medical practice in order to solve the problem of infertility. Sub-Saharan Africa bears most of the burden of this problem, with the prevalence of infertility being as high as 30-40% 9 with the male contributing between 40-60% of this figure [3, 9].

Poor Semen quality was wholly responsible for all the cases of male subfertility in this study. This might be due to the fact that men in our society do not easily volunteer the details of their sexual history and cases of impotence and erectile dysfunction are easily missed. Another reason why some cases of male factor subfertility may not be detected is the fact that our centre does not have the facilities for carrying out antisperm antibody and chromosomal tests. Imade et al [6] found poor semen quality in 71% of their patients in Jos. Semen quality is influenced by several factors including skill and competence of the analyst, duration of abstinence from sexual intercourse, accessory gland infection, the time between the collection and the analysis of the specimen, the mode of collection of the semen and the type of counting chamber used [7]. In this series oligozoospermia and astheno-zoospermia were the most common abnormalities detected in the seminal fluid of the men analyzed. This is similar to the finding in Maiduguri and other less arid climates[3, 6, 9, 10], suggesting that environmental temperature is not responsible for abnormalities in semen quality.

Seminal fluid analysis is an important laboratory tool in the

evaluation of male partners of infertile couples. The method used for seminal fluid analysis range from the traditional methods involving the use of counting chambers to the more modern Computer Assisted Semen Analysis (CASA)[11]. {CASA allows a description of the average path velocity (VAP) and the curvilinear velocity (VCL, the actual path of spiral progress} which are thought to be better related to outcome. Most infertility and Assisted Reproductive Technology Clinics in the developed societies worldwide now make use of semen analysis carried out with CASA standards[7, 12].

The place of testicular biopsy in the evaluation of male infertility is rather controversial. Testicular spermatozoa are now used for intra-cytoplasmic sperm injection (ICSI) during In-vitro Fertilization (IVF) [13]and studies suggest an increased risk of testicular carcinoma in situ (CIS) in idiopathic azoospermia[7].

It is therefore recommended that except where testicular CIS is suspected, testicular biopsy should carried out only when adequate microsurgical facilities are available to treat obstruction to sperm transport and when facilities are available for cryopreservation of spermatozoa and/ or part of the excised testicular tissue for further use in assisted reproduction [7.]

Some microsurgeons prefer that biopsies be avoided altogether for fear of compromising future microsurgical procedures[14].

Most cases of male subfertility defy conventional treatment methods[6,7,11], but the advent of the current micro-manipulation techniques of assisted reproductive technology like Zona drilling (ZD) partial Zona dissection (PZD), Sub-Zonal insemination (SUZI) and most currently, intracytoplasmic sperm injection (ICSI) have revolutionized the management of male subfertility, especially those with multiple defects like oligo-asthenozoospermia and oligo-tetrato-astheno-zoospermia which together made up 31% of the cases in this series. They would have been otherwise unable to father their own children[11, 13]. In this series, poor semen quality was the parameter used to select the cases of male subfertility that were analyzed. The role of other abnormalities like the variococoele, male genital tract infection and groin surgery, such as herniorraphy and hydrocoelectomy, which could potentially damage the vas deferens need to be further evaluated.[6, 7, 10, 11].

Sexually transmitted infections (STI) especially those caused by Chlamydia trachomatis and Neisseria gonorrhoeae, are very common in Sub-Saharan Africa [9, 10] and may contribute to the aetiology of male infertility. In the male, these two infections begin as urethritis and are usually symptomatic. However, asymptomatic infections are very common in areas with a high prevalence of these infections and where treatment is inadequate likely is usually the case in our environment. An ascending infection may also affect the prostrate gland and the seminal vesicles. The epididymis may also get involved as a consequence of retrograde passage of infected urine or purulent discharge from the urethra along the lumen of the vas deferens. Both chronic epididymitis and chronic seminal vesiculitis may be associated with occlusive azoospermia[10]. Engorgement of the pampiniform plexus of veins (varicocoele) may suppress spermatogenesis through elevation of the intra-scrotal temperature above its normal value of 32^{o}C. Herniorraphy (particularly in young children) may result in the vas deferens being damaged with partial or total obstruction, or an immunological reaction being set-up with the production of antisperm antibodies. These may also happen after hydrocoelectomy or any other inguino-genital surgery. Groin trauma may lead to testicular injury with subsequent testicular atrophy, or may cause disruption of the blood-testis barrier with the production of antisperm antibody. [7]

In this series, obstructive azoospermia was the commonest finding. Azoospermia in the presence of a high FSH and LH might indicate primary testicular failure which can be comfirmed by histology of a biopsy specimen. Azoospermia with a normal serum FSH and LH indicates normal spermatogenesis with blockage and this can be confirmed also by histology of a testicular biopsy. This will also show the level of the obstruction.

Since the aetiology of male subfertilty are myriad, a systematic and careful search for the cause in each individual case should be conducted as the treatment of poor semen quality can be difficult, and most times impossible. The cost of Assisted Reproduction at present is far beyond the reach of the average African[15].

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