PATTERN OF SEMINAL FLUID INDICES AMONG INFERTILE MALE PARTNERS ATTENDING THE INFERTILITY CLINIC OF UNIVERSITY OF MAIDUGURI TEACHING HOSPITAL, MAIDUGURI NIGERIA.

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ABSTRACT

OBJECTIVE: To determine the pattern of seminal fluid indices among infertile male partners attending University of Maiduguri teaching hospital infertility clinic.

METHOD: Two hundred consecutive male partners between January- December 2003 were recruited for the study.Duration of marriage without evidence of conception were between 2-6 years.Seminal fluid were collected and analysed.

RESULTS: The mean age of the males was 35.5 +7.4 years. males within the age-group 30-39 years(51.0%) and 40-49 years(21.0%) constituted the highest cases of infertility and bacteriospermia.One hundred and eight (54.0%) were normospermic. 52(26.0%) were oligospermic and 40(20.0%) azoospermic.Staphylococcus aureus(62.5%) was the most commonest bacteria isolated followed by Klebsiella spp(28.2%) and Candida spp(3.1%).Comparing the seminal fluid analysis of bacteriospermia and nonbacteriospermia, there was reduction in the volume and motility.

CONCLUSION: The study revealed that male infertility remains a problem in this environment. The high incidence of asymptomatic bacteriospermia among the male partners and the consequential effect on the seminal fluid indices constituted major factors in male infertility evaluation. Therefore, standardized seminal fluid procedures/analysis is recommended for proper evaluation of male infertility and periodic data analysis of seminal fluid indices at different location would assist in better understanding and peculiarity of the situation.

Keywords: seminal fluid, male infertility, bacterial infection.

INTRODUCTION.

Infertility remains a worldwide problem among married couple, manifesting in emotional stress and social stigma[1]. The effect of infertility is highly felt in sub-Saharan Africa and other developing countries, where culture believes in large family size. In these societies, the woman remains the main culprit in most cases of infertility[1,2]. The incidence of infertility among married couples is gradually assuming alarming proportion worldwide[1,3]. World Health Organisation[4] reports that male reproductive capacity was found to be deficit in not less than 50% of infertile couples.The male contributory factor in infertility have estimated average of 49.5% in most African countries[5-7], 55-93% in southeastern Nigeria[2], and 41-49.9% in southwestern Nigeria[8]. Sexually transmitted diseases, and recently the HIV pandemic poses the major contributory factor in male and female infertility[1,9,10]. There are documented evidence of the effect of non-gonococcal and gonococcal urethritis on sperm concentration and motility[11,12]. Other aetiological factors capable of having an effect of the seminal fluid include, testicular failure, epididymitis ,varicoeles, hormonal and immunological influence[13]. The high prevalence of antibiotic misuse for the

treatment of genital/urinary tract infection , a norm practice in most cities of Nigeria, further compounds the problem. Seminal fluid analysis is one of the first line diagnostic index in the determination of possible fertility in married couples. Cooper[14] observed that there are variation in seminal fluid analysis results between laboratories, thus the need for proper assessment and evaluation of the variables in relation to the particular environment.

This study examined the pattern of seminal fluid indices among male partners of infertile couples who presented at the gynecology clinic of the University of Maiduguri Teaching Hospital (UMTH).

MATERIAL AND METHODS

The study is based on the seminal fluid analysis and bacteriological investigations carried out on the seminal fluid submitted to Medical Microbiology laboratory, UMTH the infertility clinic during the period of January -December 2003.The subjects were two hundred consecutive male partners of infertile couples. The period of infertility ranges between 2-6years ,Seminal fluids were collected from the subjects by masturbation and in some cases coitus interrupus into sterile universal bottles, after 2-3 days of sexual abstin ence.The samples were submitted to the laboratory within 30minutes of collection for seminal analysis.

The seminal fluids were examined for the volume in milliliter, sperm density in millions per milliliter, using the improved Neubauer counting chamber by counting the sperm cells within the ruled area and multiplied by the dilution factor. The motility was determined by comparing the percentage of the motile sperm cells to dead cells,and the morphological appearance of the normal to the abnormal sperm cells.Those with abnormal results had another sample taken after 3 weeks and the average of the 2 reading were taken for this study.For the purpose of this study, a normal semen has the following parameters on analysis (15),

Seminal fluid volume- 2-5ml
Density-20-120million cells/ml
Motility->50%
Morphology(normal cells)-> 60%

A sperm density of < 20million cells/ml was regarded as oligospermia, while a density of > 120 million cells/ml was classified as hyperspermia.Total lack of sperm cells in the seminal fluid was regarded as azoospermia .Couples who had achieved pregnancy before, irrespective of outcome had secondary infertility while those who were never pregnant were regarded as having primary infertility.

Seminal fluids were inoculated on chocolate and MacConkey agar media, incubated at 37oc for 24 hours .The organism were identified and isolated by standard technique and antibiotic sensitivity was determined by disc-diffusion method .The results obtained were statistically analyzed using the Chi-square test for comparing the infected and the non-infected seminal fluid.

RESULT

The mean age of the subjects was 35.5+7.4 years .The age distribution and bacteriospermia was presented in table I, with age-group 30-39 years accounting for 51.0% and 40-49 years 21.0% of cases with bacteriospermia.The microorganisms isolated in the seminal fluid is presented in table II, *Staphylococcus.aureus* was the most common (62.5%), followed by *Klebsiella. spp* (28.2%), while *Escherichia. coli*, other coliforms and *Candida albican* accounted for 3.1%each .

Table III, shows the seminal fluid analysis of the 200 male subjects studied. The male subjects were classified into three groups, 20% were azoospermia,males with < 20 million cells/ml accounted for 26% and 108(54.0%) had semen density between 20-120million cells/ml. .Comparing the mean result of the abnormal forms with the motility of the sperms cells, it shows that the abnormal forms bore an inverse

relationship to the semen density. An average of 48.9% of abnormal forms were observed in males with less than 20million cells/ml group and average of 23.8% in males with 20-120 million cells /ml. Also, there was a direct relationship between the motility and the semen density, as subjects with less than 20million cells/ml semen density had an average of 38.7%, while subjects with semen density between 20-120millioncells/ml had an average of 70.0%. The seminal fluid, homogeneity and viscosity indices bore no particular relationship in any of the groups.

Table IV,shows the statistical breakdown of the seminal analysis into two groups, infected and non-infected subjects. The seminal fluid indices of the infected subjects showed reduction in the value of the volume, semen density, and motility. Comparatively, there was observed statistical significance difference in the seminal fluid volume and motility as presented. Out of the 40 azoospermic subjects.10(25.0%) were infected with bacteria and fungi, while of the 52 oligospermic, 18(34.6%) were infected and of the 108 normospermic, only 38(35.2%) were infected.

The overall antibiotic sensitivity pattern of the bacterial pathogen as presented in figure I, showed sensitivity to the quinolones and cephalosporins and resistant to the rifampicin and ampicillin-clavucillin.

Table 1:Age distribution and bacteriospermia of infertile male partners attending the infertility clinic of University of Maiduguri Teaching Hospital, Maiduguri,_Nigeria January-December 2003

Age-group	Bacteriospermia (%)	No. bacteriospermia (%)	Total (%)
20-29	10(31.3)	22(68.7)	32(100)
30-39	34(33.3)	68(66.7)	102(100)
40-49	14(33.3)	28(66.7)	42(100)
50-59	6(25.0)	18(75.0)	24(100)
Total	64(32.0)	136(68.0)	200(100)

Table II :Frequency Of Microorganism Isolated From Male Partners Attending Infertility Clinic Of University Of Maiduguri Teaching Hospital Nigeria Jan-Dec2003

Microorganism	Frequency	PERCENT TOTAL (%)
Staphylococcus. aureus	40	62.5
Klebsiella. Spp	18	28.2
Escherichia .coli	2	3.1
Other coliforms	2	3.1
Candida albican	2	3.1
Total	64	100

Table III: Seminal fluid Analysis of Male infertile partners attending Infertility clinic of University of Maiduguri Teaching Hospital Maiduguri, Nigeria Jan-Dec 2003.

Group	Semen density	Mean (%) abnormal forms	Mean (%) motility
Azoospermia	40(20.0)		
<20million cells/ml	52(26.0)	48.9	38.7
20-120million cells/ml	108(54.0)	23.8	70.0
> 120 million cells/m	-	-	-

Table IV: Statistical Analysis Of Data From Jan-Dec 2003

	A subjects studied n=200	B Infected n=64	C non-infected n=136	D p Value
Mean vol (ml)	3.6 +1.3	3.2 +1.3	3.8+1.2	p< 0.05*
Mean sperm density	34.8 +32.9	33.2+30.7	35.9+ 33.0	p> 0.05
Mean motility (%)	50.5+39.7	48.9+37.6	60.0+40.5	p< 0.05*
Mean abnormality (%)	25.1+25.9	30.3+21.6	26.6+23.9	p>0.05

*= p value <0.05 are considered significant

±= stardard deviation of mean

DISCUSSION

Seminal fluid analysis with standardized techniques remains the diagnostic index in proper evaluation of infertility cases[2,7]. The analysis had contributed greatly in male factor implication in most cases of infertility, mostly attributed to women as documented in various studies[2,8]. Though the quality and the quantity of the seminal fluid is still a determinant factor in the possibility of conception, other possible factors capable of influencing the potential capacity of the spermatozoa ranging from hormonal, genetic disorder and diseases like testicular failure, urethral stricture, varicocle and epididymo-orchitis. Studies have reported variation in the accepted normal limit of seminal fluid volume[13,16,17]. Macleod et al[18] observed higher semen volume in infertile male than fertile males. In this study, the mean volume of the subjects was 3.6ml which was within the accepted normal limit. The mean semen volume of the infected males showed reduction in the volume which was statistically significant. Previous study showed no relationship between volume of semen ejaculated and the possibility of conception[19].

The sperm density of the males compared favorably with reported studies[1,7], however, the number of azoospermic and oligispermic males are relatively high compared with normospermic males studied.The volume of seminal fliud with microorganisms isolated were less compared to those with the presence of pus cells without corresponding microorganism isolated. These observations could best be explained by possible factors capable of influencing the seminal fluid analysis indices which might includes, asymptomatic clinical conditions, antibiotic misused in the treatment of genital/urinary tract infection and the presence of non-cultivable agents like *Chlamydia trachomatis Lymphogranuloma venereum*, *Mycoplasma*[2], *Herpes simplex* and *Human papilloma viruses*[8,9]. Seminal fluid/genital tract infection as a major cause of male infertility has been reported in most studies[10,11]. The seminal fluid infection is 32.0%, the value recorded is relatively comparable with other studies,16%[2] and 39.1%.[8] The reduction in seminal fluid values of infected compared with non-infected ones, confirmed the effect of infection in infertility in both partner. The effect of infection on both couples poses great concern, especially in the evaluation of asymptomatic subjects. The effect of microorganism on the quality and the quantity of seminal fluid have been well documented[5,6]. The microorganisms isolated were similar with other studies[2,11,20].In this study *Staphylococcus.aureus* accounted for 60.5%, this difference in the frequency of occurrence of the isolates underscores the variation location and studied population. Alausa and Osoba et al[10] and Sogbesan et al[21] reported the isolation of the flagellate, *Trichomonas vaginalis* alongside other common bacteria, with exception of *Neisseria gonorrhoeae* . The non-isolation of *Neisseria gonorrhoeae* in thi

study, underscores the delicate nature of the bacteria, resulting in death before culture.The non-isolation of *Trichomonas vagnalis*, might be a reflection of the low prevalence among the males as compared the females. *Candida albicans* was isolated in two normospermic males. This finding could explain the association of *Candida albicans* and other yeasts in some cases of uretheritis[10], though there is the possibility of a vaginal contamination.

Spermatozoa motility index is considered as an important factor in evaluation of seminal fluid quality and quantity. There have been different classification methods from the grading system of 1-4 concept[22] to the percentage system with accepted minimum range of 40-45%[15,16], to the recent documented finding that suppressing sperm concentration below 3million/ml had a contraceptive efficacy of 1.4 conception per 100couple/year[23]. The mean percentage motility in this study is 50.5%, the mean percentage motility of infected and non-infected males showed significant difference, this observation further confirmed the effect of asymptomatic infection in most infected couples. This study agrees the with finding of Cockett et al[24], Nkpongsong et al[25] that the motility of spermatozoa increases as sperm density increases. However, there are some cases of high spermatozoa motility, with low sperm density (10million/ml), which could not be explained with this seminal fluid analysis, as other investigations might be needed to confirm this finding. However, studies have shown that there are possibilities of conception with low sperm density as 10million/ml[21] if those factors capable of hindering conception are not evident.

The effect of microorganism in seminal fluid analysis is highly manifested in most reported studies, sequel to other possible factors capable of contributing to infertility in this environment. The antibiotic sensitivity pattern of bacterial pathogens underscores the practice of antibiotics misuse due to easy availability and purchase without proper prescription. We strongly subscribe for the standardized seminal fluid analysis procedures, including prostatic fluid (m/c/s), especially in most infertile males with low sperm density and presence of pus cells, without corresponding bacterial growth. We recommend periodic update of seminal fluid analysis data with the gynaecologist for better evaluation of infertility in our environment.

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