AFRICAN JOURNAL OF CLINICAL AND EXPERIMENTAL MICROBIOLOGY SEPTEMBER 2004 ISSN 1595-689X VOL 5 NO 3
AJCEM/2003041/2439

SEMINAL FLUID ANALYSIS AND BIOPHYSICAL PROFILE: FINDINGS AND RELEVANCE IN INFERTILE MALES IN ILORIN, NIGERIA

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To determine if there was a bearing of body mass index (BMI) on male infertility, a cross-sectional study of males of infertile couples, attending our infertility clinic was carried out. Apart from BMI determination, the semen of these men were analysed to ascertain their spermogram. Out of 47 men involved in the study, 66% (31) were below 40 years of age. Seventeen (36.2%) of these were between 30-39 years. About 49% of the study subjects had oligospermia, while 23.4% were azoospermic. Those subjects between 30-39 years had the worse spermogram. Thirty-two (68.1%) and 34(72.3%) of the whole population had good spermatozoa motility and morphology respectively. Poor BMI, whether low or elevated, affected the semen quality. In conclusion, infertile males should be encouraged to seek help early. Attending clinician should pay attention to their past or present genital infections and the biophysical parameters.

INTRODUCTION

Despite the assumption that Africans are characterized by high fertility, the magnitude of infertility and reproductive failure in Africa, continuously receives the attention of many scientists (1). This is so because most traditional African cultures place high social premium on fertility, hence childlessness is a major personal tragedy and humiliation for the individual concerned (2). Women are usually made to bear such personal tragedy as they are commonly, though wrongly, blamed for infertility. This is in spite of the fact that male factor, has been shown to be responsible for up to 50% of cases of infertility (3). In Nigeria, the prevalence of male infertility has been suggested to be on the increase (4, 5). At the same time, obesity said to be on the increase in developing countries (6), is associated with increased lipoperoxidation (7) and decreased sperm quality (8).

The aim of this study was to evaluate the seminal fluid and body mass indices of infertile men in our centre. This was to ascertain if there was any relationship between them vis-à-vis fecundity.

MATERIALS AND METHODS

This cross-sectional study was carried out between December 2002 and May 2003, at the University of Ilorin Teaching Hospital, Ilorin, Nigeria. The subjects were the husbands of women undergoing investigation for infertility at the infertility clinic of the hospital. These men were adequately briefed about the study and their consents obtained. The semens of the subjects were collected after three to five days abstinence from sexual intercourse. We particularly advised semen collection after masturbation, within the hospital where possible. For those who opted to collect semen at home, they were told to ensure that the sample gets to the hospital within one hour. As much as possible, coitus interruptus was discouraged.

Samples were collected into clean wide-bore container, devoid of any chemical remnant or detergent. Semen analyses were done immediately on receipt of samples by the same person, based on the commonly used criteria in our environment (9). The weight and height of each subject was measured and recorded, from which the body mass index (BMI) was determined (10).

RESULT

Forty-seven subjects were recruited into the study. The mean age of the subjects was 36.2 years and ranging from 24 - 55 years. Sixty-six percent of the subjects were below 40 years of age, 10.6% were above 50 years and 23.4% were between 40-49 years. Seventeen (36.2%) of those less than 40 years, were aged 30-39 years (Table 1).

Seventy two percent of the study population had abnormal spermogram. Those with oligospermia constituted 48.9% while the azoospermics were 23.4% (Table 2). With regard to motility, 32 (68.1%) subjects had more than 60% actively motile spermatozoa while 31.9% had less than 60% motility. Also, 34 (72.3%) subjects had more than 60% normal spermatozoa morphology and 13 (27.7%) had less than 60% normal morphology.

The subjects who were in the age group 20-29 years had the highest mean spermatozoa count of 37.23 million/ml. The least count of 11.8 million/ml was recorded in the age group 30-39 years. Similarly, the highest mean motility (63.93%) was noticed in the 20-29 years age group, while the least motility of 49.38% was seen in the 30-39 years age group (Table 3).

Poor BMI, whether low or elevated, was associated with abnormal sperm count and motility. Those with normal BMI (20-24 kg/m^2) had the highest mean sperm count of 39.35 million/ml and the highest mean sperm motility was observed also in this 20-24kg/m^2 BMI group (Table 4).

Table 1: Age distribution of infertile males in Ilorin

Age group (Years)	Frequency	(%)
20-29	14	29.8
30-39	17	36.2
40-49	11	23.4
50-59	5	10.6

Table 2: Percentage distribution of sperm count among infertile males in Ilorin

Sperm count (millions/ml)	Frequency	Percentage (%)
0	11	23.4
<20	23	48.9
20-39	6	12.8
40-59	3	6.4
60-79	2	4.3
80	2	4.3

Table 3: Age frequency and the corresponding distribution of sperm count sperm motility and BMI, in the different age group

Age group (Years)	Frequency (%)	Mean count (million/ml)	SD	Mean motility (%)	SD	BMI (kg/m²)	SD
20-29	14(29.8)	37.23	87.70	63.93	35.42	23.26	4.94
30-39	17(36.2)	11.18	16.92	49.38	42.30	25.72	5.12
40-49	11(23.4)	23.37	25.41	65.46	33.50	24.11	3.06
50-59	5(10.6)	12.87	16.47	59.00	38.31	23.16	4.69
			P=0.4637		**P=0.6648**		**P=0.4615**

Table4: Effects of BMI on sperm counts and motility

BMI (Kg/m²)	Mean count (millions/ml)	SD	% mean motility	SD
15-19	4.5	5.55	27.50	42.63
20-24	39.35	73.85	74.47	27.23
25-29	14.27	23.35	54.41	38.12
30-34	3.00	4.24	42.50	60.10
> 35	0.175	0.141	55.00	42.43
		P=0.0932		**P=0.0756**

DISCUSSION

Out of over ninety women seen in the clinic, and whose husbands were invited, only forty-seven showed up and were finally recruited for the study. Even though men contribute between 30-50% of the causes of infertility (3, 11), the society is yet to fully appreciate this. The community need to be properly educated on this, as the longer the couples remain infertile, the worse their chance for an effective treatment (12). Particularly, this delay in seeking help is not good for men. It has been shown that semen qualities deteriorate by as much as 3% per year (13). This is significant given that most of the men in our study were between 30-39 years of age. The impression thereof is that our men marry lately or seek help lately in the hospital. It is possible that these factors add up to contribute to the high percentage (72%) of abnormal spermogram among our subjects. Earlier on, a 40-50% prevalence of abnormal spermogram was reported in males of infertile union in Nigeria (14).

This study showed that 23.4% of our subjects were azoospermic, as against 35% seen in a more specific male infertility clinic in Ibadan, Nigeria (15). The prevalence of azoospermia in our study and that of Ibadan is worrisome. Two important causes of azoospermia are failure of spermatogenesis and bilateral ductal obstruction (16). Ojengbede *et al* (17) are of the opinion that rather than bilateral ductal obstruction, azoospermia in Nigeria is more likely to be due to failure of spermatogenesis. This is because most of the azoospermics in their study (17) had prior sexually transmitted diseases which have been linked to seminiferous tubular damage and infertility (16, 18).

In our study population, asthenozoospermia and teratozoospermia were not serious problems. About 70% of the determined spermogram had good motility and morphology. This is good, because even those with oligospermia have a good chance of achieving pregnancy, especially in absence of sub-fertility of the partner (9, 11). The subjects in the age bracket 30-39 years had the least sperm count and motility. One contributor to this scenario is thought to be infection as this has been linked to infertility (5, 16, 17, 18).

Added to the possibility of infection in our patients, BMI abnormalities also contribute significantly to the problem. Low sperm count and poor spermatozoa motility were associated with abnormal BMI in the study. Though not statistically significant, we observe that the highest mean BMI was recorded in the 30-39 years group, which recorded the worst spermogram. Elevated BMI is associated with increased lipoperoxidation and generation of reactive oxygen species-ROS (7). Studies have shown that 40-88% of infertile patients have high levels of ROS (19), and this can cause low sperm counts, defective sperm structure, reduced motility and ability of sperm to penetrate the oocyst or egg cell (20).

CONCLUSION

It is imperative from the foregoing that the infertile male should be investigated early and thoroughly evaluated like the females. The evaluation of the infertile male should be rapid, if possible, non-invasive and cost effective. It is essential that the right diagnosis is made on time, as this is a very important part of the management of male infertility (21). In our environment, attention should be paid to infection, whether residual or ongoing, and the biophysical parameters of concerned individual should be evaluated and managed as necessary.

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