



Semen Analysis of Infertile Sudanese Males in Gezira State Central Sudan

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Abstract

Objective: The aim of this study is to determine the major causes of infertility in Sudanese males based on the clinical and laboratory findings.

Methods: The sample of 194 Sudanese males attending Gezira Hospital for Renal Diseases and Surgery, aged between 21-85 years were collected and analyzed. The method of masturbation after 3-5 days prior abstinence from sex before sample collection was applied. The samples were examined for semen volume, and microscopically as wet preparation for sperm motility, morphology and count.

Results: Of these men, 53.2% were primary infertile, while 46.8% were secondary infertile. The semen volume results showed that 89.7% were normal. In the sperm morphology, 65.9% showed abnormal morphology. Azoospermia was present in 72 patients (37.1%), 13.4% had oligozoospermia.

Conclusion: This study reveals the main contribution of sperms' abnormal morphology to infertility and it is important to abstain from sexual intercourse some days before collection of semen for analysis.

Key words: infertility, Sudanese males, semen analysis.

INTRODUCTION

Infertility, defined as the inability to conceive after at least 1 year of unprotected intercourse, affects about 812% of couples in the world ⁽¹⁾. Between countries and regions, infertility rates vary dramatically, corresponding to the incidence of preventable conditions, which can lead to infertility. In some areas, particularly in sub-Saharan Africa, up to one-third of couples are infertile and of them approximately 52% suffer from acquired infertility. On the contrary, the

percentage of secondary infertility is lowest in Asia and in developed countries; 23% and 29%, respectively ^(2,3).

Infertility could be caused by male factors such as Azoospermia, oligozoospermia, asthenozoospermia and/or teratozoospermia, or female factors such as tubal occlusion, ovulatory dysfunction, uterine abnormality, peritoneal factors and/or endometriosis. However, the problem could be from the male or the female partner alone or from both partners. Unfortunately only the woman is blamed for



childlessness in our African society. This explains why she is usually left on her own to find the solution to this problem from any source, ranging from spiritual to religious treatment (4).

Therefore, this study aimed at determining the major causes of infertility in Sudanese males, based on clinical and laboratory findings in order to promote the involvement of males in reproductive health issues and in the prevention of infertility in particular.

MATERIALS AND METHODS

One hundred ninety four males from Gezira state; in central Sudan, were involved in this study. They were attending the Gezira Hospital for Renal Diseases and Surgery for laboratory analysis of their semen. They were aged between 21-85 years and the duration of infertility between 3-5 years, and they were married for period between 1-25 years.

The clinical workup consisted of a detailed questionnaire on general and reproductive health, and clinical examination.

The parameters analyzed were semen volume, sperm count and motility and sperm morphology. The semen samples were collected aseptically by masturbation into sterile wide-mouthed specimen bottles after 3 to 5 days of abstinence. Semen samples were collected within the hospital premises or at home (in exceptional cases) and delivered to the hospital within 1 hour of collection. The samples collected were all analyzed within 10 minutes by a laboratory scientist.

Semen analyses were performed according to the methods and standards of the World Health Organization (5).

A wet preparation was mounted on the microscope and the sperm motility, count and morphology were determined. Motility was determined by finding the percentage of motile sperm cells against the dead cells.

Statistical analysis was performed by pooling the results together and the mean was recorded. From the number of specimens, the percentage was worked out and recorded.

RESULTS

Seminal fluid samples collected from 194 males were analyzed. The mean age of the patients was 38.2 (range 21-85 years) and 53.2% were primary infertile. The mean duration of infertility was between 3-5 years and for marriage time was 7 years (range 1-25 years) (Table 1)

Characters	Number	%	
Age	<25 years	12	6.2
	25-35 years	58	29.9
	>35 years	124	36.9
Residence	Urban	116	40.2
	Rural	78	59.8
Marriage time	< 1.5 years	30	18.1
	1.6-4.0 years	38	22.9
	4.1-8.0 years	42	25.3
	> 8 years	56	33.7
Type of infertility	Primary	84	53.2
	Secondary	22	13.9
Duration of infertility	< 1.5 years	34	17.2
	1.6-4.0 years	56	43.3
	> 4 years	84	28.9

Table 1: Demographic data of infertile Sudanese males.

Varicoceles were present in 43 cases (22.2%) followed by solitary testicles in 25 cases (12.9%) and infection (e.g. gonorrhoea) in 23 case (11.9%) (Table 2).

Feature	No. of cases (N = 194)	%
Varicocele	43	22.2
Bilateral undescended testicles	13	6.7
Solitary testicle (trauma, congenital, surgery, atrophy)	25	12.8
History of Mumps	07	3.6
Infection (e.g. gonorrhoea)	23	11.9

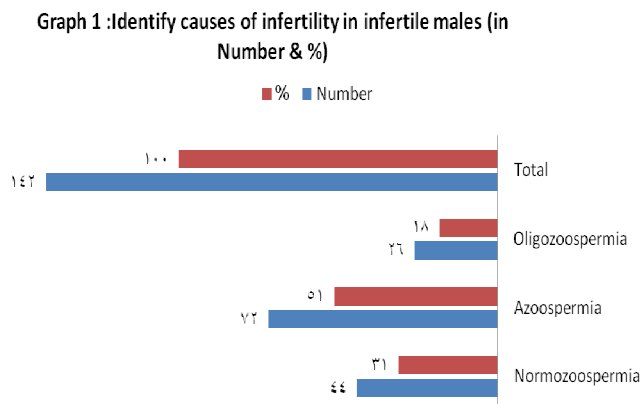
Morbid obesity	06	3.1
Hernia repair, surgery for hydrocele	13	6.7

Table 2: Clinical diagnosis of infertile males.

Using the WHO standards for seminal normality, 72 patients (37.1%) presented Azoospermia and 26 cases (13.4%) presented oligozoospermia (sperm density <20 million/ml) (Table 3 & Graph 1).

Male factor	No. of cases (N = 194)	%
Normozoospermia (20X10 ⁶ to 150X10 ⁶)	44	22.7
Azoospermia (no cells)	72	37.1
Oligozoospermia (< 20 million sperm/ml)	26	13.4

Table 3: Identify causes of infertility in infertile males.



The majority of the subjects (89.7%) had adequate semen volume, while only 10.3% had abnormal semen volume (7.2 hypospermia and 3.1 hyperspermia) (Table 4).

Volumes (mls)	Number of specimen	%
Normospermia (2-5mls)	174	89.7
Hypospermia (<2mls)	14	7.2
Hyperspermia (>5mls)	6	3.1

Table 4: Distribution of volumes.

Morphology	Number of specimen	Percentage
Abnormal (> 20% abnormal morphology)	126	65.9
Normal (<20% abnormal morphology)	68	35.1

Table 5: Distribution of morphology

Discussion:

Reports of declining sperm counts and increasing incidence of urogenital abnormalities in some regions of the world have stirred public interest and concern (6-11). Whether there is deterioration of semen quality is controversial (12-16). More recent data in fertile men in Europe and the United States show marked differences in sperm concentration between different countries and different regions of the same country (17-18). Government environmental agencies and national and international scientific societies have conducted discussions on this topic without a clear consensus emerging. Further studies, perhaps on varied populations in areas with and without known environmental pollutants or toxins are needed to address this issue.

This study was conducted to analyze the semen of infertile males in central Sudan. The sample size is quite small since the men are generally reluctant to subject themselves to investigation and this also may explain the high percentage of infertility over 4 years. It was rather difficult to or near impossible to get seminal fluids from normal subjects hence the lack of comparison of the results obtained with a control from the same

environment. This is because of the age-long difficulty in convincing the average Sudanese male to produce semen for analysis especially if he has no fertility problem. This study has revealed a high prevalence of primary infertility in our study environment. Other workers have obtained the similar results (19-21). Varicoceles was found to be the common clinical finding among study subjects (22.2%), which was in agreement with Bornman et al. (1994). Sexual performance is often regarded as an index of infertility, and the high frequency of infection with gonorrhoea (11.9%) in this study would lead us to carefully consider the concept of STD among infertile subjects.

In this study, we recorded a higher value of 37.1% of azoospermia. This is based on the theory that lower limits for semen quantity of 20 million per milliliter of ejaculate has been established under which a pregnancy is unlikely to occur⁽²²⁾. The 3-5 days abstinence applied in this study as recommended by Mortiner et al (1988)⁽²³⁾, and Larry and Stunct (1991)⁽²⁴⁾ may result in the adequate semen volume in addition to the low percentage of oligozoospermia. Although, we did not record the specific type of abnormality in the morphology of the sperm cells, our results agree with Altken et al (1982), Mackleod et al (1989) and Larry and Stunct (1991), that semen of infertile males contains a higher percentage of abnormal forms. Our abnormal morphology value (65.9%) is higher than the WHO recommendation (1987)⁽²⁵⁾ and 45% recommended by Larry and Stunct (1991). Hence, the abnormal sperm morphology as observed in this study subjects may have contributed to the male infertility.

In conclusion, our results suggest that seminal fluid volume plays little or no role in the etiology of male infertility. The role of sexual abstinence before seminal fluid sample collection for accurate semen analysis is important. Special emphasis should be directed on the promotion of male's involvement in reproductive health issues and in the prevention of infertility in particular.

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