MALE INFERTILITY, A PERSONAL EXPERIENCE.

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Abstract

Objective: To study the incidence and aetiology of male infertility in Mombasa, Kenya

Design: A 6-year retrospective study

Setting: The Mombasa Hospital Private Clinics, from January 1996 to 2001

Subjects: 43 men, aged between 21 and 55 years, referred to me with the chief complaint of infertility of unknown cause

Intervention: Patients were managed conservatively and operatively

Measurement: Histological and laboratory evaluations

Results: Of the 43 patients observed, 10 (23%) presented with signs of hypogonadism, 15 (35%) with signs of acute and subacute inflammatory process (pain and swelling), 4 (9%) had prolactinaemia, 2 (5%) had signs of gonadotropin insufficiency and another 2 (5%) patients had varicocoeles. We did not establish the cause in 10 (23%) patients.

Conclusion: Male infertility in Mombasa appears to be primarily due to hypogonadism (23%), although in an equal proportion the cause is not obvious (idiopathic). A significant number of the infertility cases can be attributed to easily treatable conditions such as infections and infestations (16%). The sample available is however not big enough to warrant any major conclusions as to the overall male infertility status in Mombasa. Nevertheless, this study is important in its groundbreaking function of establishing possible avenues for future research.

Introduction

Infertility is the inability to conceive or reproduce after at least one year of unprotected intercourse[1]. Couples who fail to conceive after this period are usually assessed for fertility problems. Male infertility is a relatively under-studied and under-reported phenomenon, owing to its diagnostic and treatment complexity, and negative social pressures directed towards it. In most cases, the investigations center on the female, although more and more reports such as by Shaban[1] reveal that the man may be responsible for at least half of the problem. We present a study using data collected and tabulated from a small sample of men (n=43), who had presented with infertility issues. This data was analysed and interpreted in an attempt to understand the incidence and cause of male infertility in Mombasa.

Materials and Methods

43 patients, all male, were reviewed over a period of six years. Their age range was 21-55 years (mean 33 and SD 6.82). The study was conducted at the Mombasa Hospital Private Clinics. The patients were seen mainly on an outpatient basis, except in a few cases requiring testicular biopsy. Patient information was collected using a designed clinical questionnaire form. Parameters that could have contributed to the problem, especially among those without any apparent clinical anomaly were categorized. These included occupation, previous history of chronic infection, venereal diseases, scrotal pain and swelling and of previous surgery such as for hernia. Details of previous psychiatric illness, illicit drug use or alcohol abuse were collected where available. Marital status was also confirmed in a few subjects.

Physical examination was carried out. Particular attention was paid to assessment of overall body fat and hair distribution, breast enlargement and other signs of feminisation. Genital and groin examinations were done ascertaining presence or absence of hernia, varicocoeles, hydrocoeles and any penile deformities. The presence, position, size and consistency of the testis were assessed and recorded. The testes, epididymis and the vas deferens were palpated for cysts, nodularity and consistency. Absence of the vas was also sought for.

Laboratory investigation included a full haemogram, urine analysis, semen analysis and hormonal assays (testosterone, prolactin, FSH and LH). Testicular biopsy for histological examination was rarely done. All results were analysed and interpreted.

Results

Figure 1 presents the age distribution pattern of the 43 subjects. Most subjects (70%) were between the ages of 30 and 39, with only 1(2%) subject being over the age of 50. Table I presents the common findings after the initial clinical examination. From history available, 23(53%) subjects complained of having had some degree of impotence, while another 7(16%) of a painful scrotum. Physical examination revealed that 19(44%) subjects had various forms of gonadal abnormalities and another 8(19%) had a hard cord on palpation (sclerotic vas deferens). 5(12%) subjects presented with features of gynaecomastia, 3(7%) with varicocoeles and 2(5%) with gross features of feminisation.

Table 2 shows the type and incidence of gonadal abnormality in the 19 subjects presenting with the problem. 13(30%) subjects were found to have small testes, 3(7%) with atrophic gonads, 1(2%) with maldescended testis and 2(5%) without any testes. 24(56%) were found to have normal gonads.

Semenanalysis was carried out and the results are presented in Tables 3a, 3b and 4. Table 3a shows the sperm count results, with 12(28%) subjects exhibiting normal counts. 7(16%) subjects were found to have azoospermia and 24(56%) with oligospermia. Of the oligospermia patients 16(67%) had sperm counts of less than 20 million, and the remaining 8(33%) had sperm counts ranging from 21-59 million. The standard reference used is 60 million sperm/ml and above (The Mombasa Hospital laboratory).
The motile sperm count results are shown in Table 3b. 19(44%) had motile sperm counts (mms) of less than 0-0.45mms/ml, 2(5%) had counts ranging between 0.5-1.0 mms/ml and another 2(5%) with counts of between 1.1-10 mms/ml. 20(47%) had counts of above 20 mms/ml.

Semen microbiology results are presented in Table 4. 5(12%) were found to have signs of acute bacterial infection: 3 subjects' cultures had positive bacterial growth and the other 2 showed bacteria in gram stain. 8(19%) subjects' smears were found to have pus cells showing a possibility of chronic bacterial infection, while another 2(5%) with schistozomiasis. 28(65%) subjects did not exhibit any abnormality or sign of infection.

The results of hormonal assays carried out are shown in Table 6. 25(58%) had a normal hormonal profile, 2(5%) were found to have isolated low testosterone levels while 1(2%) was found to have

high levels of FSH and LH. 2(5%) subjects were found to have high levels of prolactin while 9(21%) had a combination of low testosterone with high FSH/LH levels. 2(5%) subjects had low levels of both testosterone and FSH/LH, while another 2(5%) had low levels of testosterone with high levels of prolactin.

Testicular biopsies, carried out in 7 subjects are reported in Table 6. 4 subjects were reported to have normal spermatogenesis while 2 had absent spermatogenesis. Testicular biopsy also revealed the presence of granulomatous epididymitis, a possible indication of tuberculosis in 1 subject.

Table 7 presents a synopsis of the possible causes of the subjects' infertility. 10(23%) patients were found to have hypogonadism (primary and secondary) and 8(19%) were assumed to have non-patent ejaculatory ducts, possibly due to chronic epididymitis. 7(16%) of these cases were attributed to active infections and infestations, while 2(5%) were as a result of varicocoeles. Hypogonadotropic hypogonadism was the possible cause in 2(5%) of the cases while prolactinaemia was suspected in 4(9%) subjects. The underlying cause of infertility was not established in 10(23%) subjects. Figure 4 presents the distribution pattern of these findings.

Discussion

Data available over the past two decades reveal that in couples who report infertility, the pathology in 30% of the cases is found in the man alone and in another 20% both the man and the woman are abnormal[1]. The male factor is therefore, responsible in about 50% of infertile couples. Most subjects were in their reproductive prime age, and had been married for several years, although this remains empirically undetermined. The claim of infertility was, therefore, sound in terms of the duration of the childlessness period.

A careful history and medical examination are important in the evaluation of the infertile man. A history of childhood orchitis (mumps), bacterial orchitis in adults, chronic urethral discharge, testicular trauma, torsion, surgical operation or other conditions suggestive of undiagnosed testicular torsion and consequent testicular damage should be considered. Interestingly, none of our patients could give any such useful history. It suffices to say that since 16% of our patients complained of some pain in the scrotum and another 19% had hardened vas deferens (possible sclerosis), a high incidence of sexually transmitted disease is probable.
None of our patients had precocious puberty, also called adrenal-genital syndrome.

2 patients (5%) had delayed puberty (indicating Klinefelters syndrome or idiopathic hypogonadism). In fact, in both patients the testes were untraceable (absent). Both patients had gross features of feminization such as feminine hair and fat distribution, facial features and abnormal voice pitch. Chromosomal studies were not done on them.

Exposure to occupational and environmental insults such as toxins, excessive heat and radiation has been cited as a cause of male infertility[1]. However, the majority of our patients were presumably exempt from this categorization although this was difficult to collaborate. None of the subjects provided a history of illicit drug and excessive alcohol consumption, citing religious and financial restraints. None of them had undergone any major abdominal or pelvic surgery.

19 patients in this study had some form of gonadal abnormalities (Table 2, Figure 2). 13 of them had small firm testis indicating some form of pre-pubertal damage and 3 had atrophic testis indicative of post-pubertal damage[1]. 5 (12%) had gynaecomastia which is a consistent feature of feminisation and 3(7%) patients had obvious varicocoeles which required surgical repair. None of the subjects showed evidence of chronic ill health such as liver disease, diabetes mellitus or any form of debilitation (two HIV positive patients were excluded from the study).

Semen analysis and hormone profiles were the main specific laboratory tests done. Semen analysis though inaccurate is easy and non-invasive. The semen volume, viscosity, motility, density and morphology were assessed using standard techniques in one laboratory by the same technician. This ensured that the same standards of evaluation were maintained. 10 (23%) patients were found to have a normal semen analysis.

Motile sperm counts (motility x concentration) is a better measure of potential to fertilize than any other simple measurement. In practice, once the motile sperm count exceeds 0.5 million motile sperm/ml (mms/ml), fertilization is possible[2]. 44% of our patients had motile sperm counts of less than 0.5 mms/ml while 47% had counts of over 20mms/ml and were, therefore, potentially capable of fertilising their partners.

Semen microbiology is also an important diagnostic tool. Evidence of acute bacterial infection was found in 5 (12%) patients while sub-acute /chronic infection was found in 8 (19%). 2(5%) patients had schistozoma infestation (Table 4). These infections exemplify easily treatable causes of infertility in men, which should be sought for.

Testis biopsy was rarely done. Other specialised tests such as the hamster egg penetration test, anti-sperm antibodies and chromosome analysis have been found to be useful[2]. These were not done in this study. Vasograms could not be done due lack of local expertise.

Hormonal assays (Table 5) are useful especially in infertile men with decreased virility[3]. 25 (58%) of our patients were found to have normal hormonal profiles. When the man is of normal virile appearance and has good libido, serum testosterone levels will usually be within normal limits[3]. The converse is also true. Although only 15 (33%) of our patients had low testosterone levels, 23 (53%) had complained of some degree of impotence. This implies that 8(9%) of them must have suffered some form of psychological impotence (night tumescence tests were not done to confirm this). 2 patients had isolated low testosterone levels, indicating possible Leydig cell dysplasia[4]. 9 (21%) had associated high FSH/LH levels indicating end organ failure (hypogonadotropic hypogonadism)[4.] 2 had low testosterone and low FSH/LH levels (hypophyseal hypogonadism)[4] and 2 had low testosterone and high prolactin.

FSH is a sensitive measure of testicular damage; high FSH (more than twice the upper limit of the laboratory normal) associated with small testes indicates severe and irreversible testicular damage[2,3,4]. 13 (30%) of our study cases had small testis while another 10 (23%) had high FSH levels. In isolated LH deficiency (fertile Eunuch syndrome), patients have a monotrophic loss of LH secretion while FSH remains normal. Due to the absence of LH, Leydig cell deficiency leads to testosterone deficiency, hence, failure to develop secondary sexual characteristics[3,4].

We did not have any such cases.

2 patients had both low testosterone and FSH/LH levels. These patients also had absent (unpalpable) testis with feminisation features. The other pituitary hormones (TSH, ACTH and GH) were within normal limits. The gonadotrophin releasing hormone (GnRH) levels were not done. Cone views of the pituitary fossae were normal. There were no midline facial defects or anosmia (Kallman's syndrome)[4,5]. The conclusion is therefore, that these patients had isolated gonadotrophin deficiency (hypogonadotrophic hypogonadism)[5]. Chromosomal studies were not done to exclude Klinefelters syndrome.

Hyperprolactinaemia causing infertility has been reported to be uncommon[1]. Prolactin-secreting tumors of the pituitary gland, whether from a microadenoma (less than 10mm) or a macroadenoma,

can result in loss of libido, impotence, galactorrhoea, gynaecomastia and alter spermatogenesis. The patients with hyperprolactinaemia usually present with a history of impotence and breast enlargement or galactorrhoea. These patients have low serum testosterone levels but basal serum levels of LH and FSH are either low or lower normal and reflect an inadequate pituitary response to depressed testosterone[1,4]. 4 (9%) showed high serum prolactin levels. All 4 had breast enlargement but no obvious galactorrhoea. One patient with breast enlargement had normal prolactin levels. These results are in opposition to the claim that hyperprolactinaemia is rare, and are indicative of a need for more research in this area.

We performed testicular biopsies in 7 patients (Table 6). Histopathology reports showed 4 had normal spermatogenesis, 2 had absent spermatogenesis with sclerosis of the seminiferous tubules while 1 was reported to have granulomas typical of tuberculosis. Testicular biopsy is rarely needed to establish the diagnosis of hypogonadism being only helpful in those who have azoospermia with normal sized testes to distinguish between ductal obstruction and failure at spermatogenesis[3]. Despite lack of adequate data it is my recommendation that testicular biopsies be done more often, especially in patients with chronic scrotal pain and those with reduced spermatogenesis without any obvious cause. There remains the distinct possibility that more testicular biopsies would have revealed an increased incidence of tuberculosis and possibly of carcinoma in situ. Increased incidence of carcinoma in situ has been reported to be associated with damaged spermatogenesis[2].

In most cases, treatment followed a conservative pattern, except in the few patients who required surgical intervention. All patients with poor sperm count were treated empirically with agents' that are reportedly able to improve spermatogenesis such as vitamin C and vitamin E (tocopheral). They were also advised to avoid alcohol and tobacco. Certain habits such as the wearing of tight underpants and hot baths were discouraged while other behaviours such as frequent sex were encouraged. All the patients with active bacterial infection and schistozomiasis were treated with appropriate agents. Most were lost to follow-up, perhaps because they had regained fertility.

The 4 patients with hyperprolactinaemia were treated with bromocriptine. They were followed up and noted to have reduced levels of prolactin. However, their sperm counts did not seem to improve significantly and they remained sub-fertile. The 2 patients with varicocoeles had varicocoelectomy done. They were thereafter lost to follow-up.

Oligospermia or azoospermia has been found to be caused by seminiferous tubule failure, which is either idiopathic or secondary to testicular infections[3]. Patients suspected to have such problems or obstruction of the ejaculatory ducts were advised to seek specialist urological expertise. However most resigned to fate as this expertise was extremely difficult to obtain. The two patients with hypogonadotrophic hypogonadism were also referred to a specialist endocrinologist. 7 patients who had no abnormal clinical or laboratory findings were referred back to their primary physician so that their spouses could get further screening. 3 patients who showed overt signs of anxiety and/or depression were referred to a psychiatrist. Patients with hypogonadism (irreversible testicular damage) were informed of the terminality of their condition and advised to seek adoption or some form of donor insemination.

Our study suffered a few limitations. First, the sample acquired (n=43) was too small to warrant the making of any major conclusions. Diagnostic tests such as semenanalyses, hormonal assays, vasograms and testicular biopsies are expensive and therefore unavailable to many patients. The most hindering factor in the whole study was the societal stigma attached to the issue of male infertility, which prevents many sufferers from seeking help. Many patients had a difficult time accepting the diagnoses and following through with the required examinations and treatment programs, greatly limiting the depth of data available.

In conclusion, the case of male infertility in Mombasa remains for the most part, unsettled. There was no clear pattern of possible causes, but it is interesting to note that in a disproportionate number of the cases, the problem remains unresolved. This elucidates the definite need for more study in this area.

References

1). Shaban, F Stephen MD. **Male Infertility: Overview; Assessment, Diagnosis and Treatment**. As obtained from the Wide World Web on 03 July 2002. Web site address: www.ivf.com/maleinfertility/papers

2). Hargreave Timothy B. **Male Infertility**. Surgery International, 1989: 6; 1673. Published by the Medicine Group, Britain.

3). The Merck Manual of Diagnosis and Therapy. Chapter 269. Endocrine and Metabolic Disorders. **Male Hypogonadism**. As obtained from the Wide World Web on 05 July 2002. Web site address: www.merck.com

4). The Merck Manual of Diagnosis and Therapy. Section 02. Chapter 07. Pituitary Disorders. **Generalised Hypopituitarism in the Adult.** As obtained from the Wide World Web on 05 July 2002. Web site address: www.merck.com

5). Martyn, Williams P L. Surgery International, 2001: 55; 267. **Undescended Testis.** Published by the Medicine Group, Britain.

Figure I: Age Distribution Chart

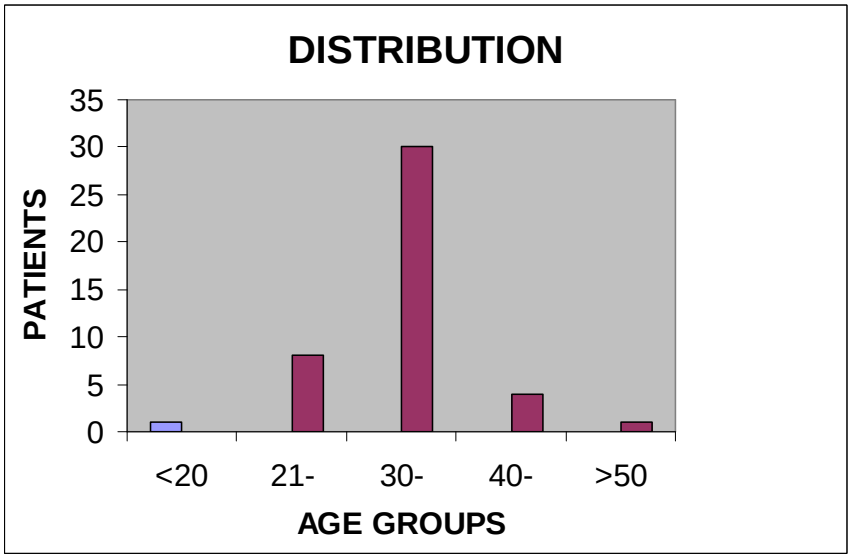

Figure I: Displays the age distribution of all subjects, with majority of them (70%) being between the ages of 30 and 40 years.

Table I: Common Findings Table

	Findings		No.	%
1	Some degree of impotence (on history)		23	53
2	Gonadal Abnormalities		19	44
3	Sclerotic vas/epididymis on palpation		8	19
4	Painful scrotum		7	16
5	Gynaecosmatia		5	12
6	Varicocoeles		3	7
7	Feminisation		2	5
8	None		10	23
	Total number of patients		**43**	**100**

Table I: Presents the common findings of the initial clinical examination

Table 2: Gonadal Abnormalities Table

Condition	No.	%
Small testes	13	30
Atrophic	3	7
Maldescended	1	2
Absent	2	5
Normal gonads	24	56
Total	**43**	**100**

Figure 2: Gonadal Abnormalities Chart

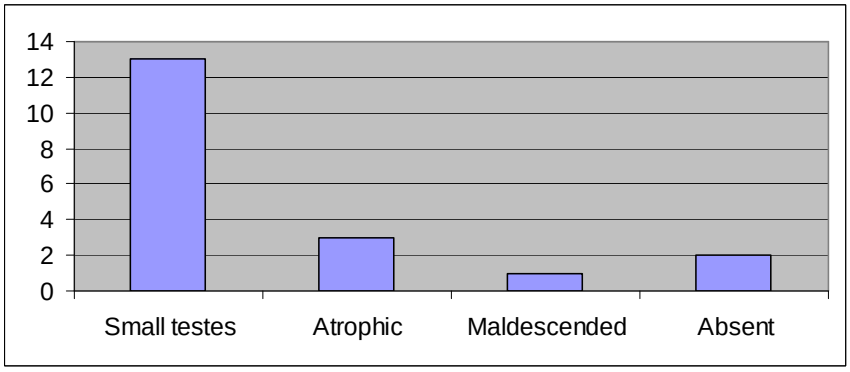

Table 2 and Figure 2: Presents the incidence and type of gonadal abnormality in the 19 subjects presenting with the condition.

Table 3a: Semenanalysis; Total Sperm Count

	Condition	*No*	%
	Normal counts	12	28
	Azoospermia	7	16
	Oligospermia		
	<20 million	16	37
	21-59 million	8	19
	Total	**43**	**100**

Table 3b: Semenanalysis; Motile Sperm Count

	Millions motile sperm/ml (mms/ml)		%
	0-0.45	19	44
	0.5-1.0	2	5
	1.1-10	2	5
	>20	20	47
	Total	**43**	**100**

Tables 3 (a) and (b): Present the laboratory findings after semenanalsysis. The laboratory normal is 60 million for the total sperm count.

Table 4: Microbiology of Semen Results

	Finding	No.	%
1	Acute bacterial infection (Bacteria in gram stain)		
	Positive growth	3	7
	Negative growth	2	5
2	Chronic bacterial infection (pus cells)	8	19
3	Schistozomiasis	2	5
4	No inflammatory cells/bacteria	28	65
Total		**43**	**100**

Table 4: Presents laboratory findings of semen microbiology, displaying cases of infection were found.

Table 5: Hormonal Assays Results

Condition	No.	%
Normal hormonal profile	25	58
Low Testosterone (T)	2	5
High FSH/LH	1	2
High prolactin	2	5
Low T + High FSH/LH	9	21
Low T + Low FSH/LH	2	5
Low T + High prolactin	2	5
Total	**43**	**100**

Table 5: Presents the results of hormonal assays carried out, important in the establishment of possible underlying causative conditions.

Table 6: Testicular Biopsies Results

	Histology	No.
	Normal spermatogenesis	4
	Spermatogenesis absent	2
	Other findings (Tuberculosis)	1
	Total	**7**

Table 6: Presents the results of testicular biopsies done, indicating the presence or absence of spermatogenesis and/or other finding such as carcinoma, or as in our case tuberculosis.

Table 7: Final Diagnosis Table

	Condition	No.	%
1	Non patent vas (chronic epididydymitis)	8	19
2	Active infections & Infestations(schistozomiasis)	7	16
3	Hypogonadism (both primary and secondary)	10	23
4	Hypogonadotropic hypogonadism	2	5
5	Varicocoeles	2	5
6	Prolactinaemia	4	9
7	Unknown	10	23
	Total	**43**	**100**

Figure 3: Final Diagnosis Chart

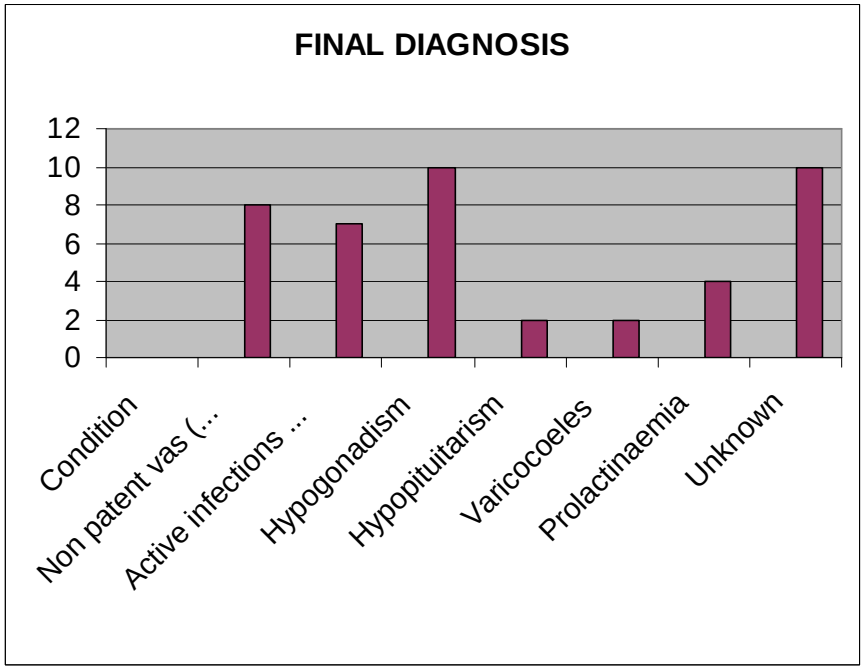

Table 7 and Figure 3: Displays the possible diagnoses established as to the underlying cause of the infertility. Notice that in a high proportion of the patients, the cause remains unresolved.