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THE CAUSES AND PATTERN OF PRESENTATION OF MALE FACTOR INFERTILITY AS SEEN AT KENYATTA NATIONAL HOSPITAL
Alvin Keya Amadi, Department of Urology, University of Nairobi College of Health Sciences, Nairobi, Kenya, P.O. Box 55077 – 00200, Nairobi, Dr, Francis Abiga Owillah, Department of Urology, University of Nairobi, P.O Box 9931 – 00100 GPO, Nairobi, Professor Peter Larry Ndaguatha, Department of Urology, University of Nairobi.

Corresponding author: Dr Alvin Amadi, Department of Urology, University of Nairobi College of Health Sciences, Nairobi, Kenya, Email: dmohalvin@gmail.com

THE CAUSES AND PATTERN OF PRESENTATION OF MALE FACTOR INFERTILITY AS SEEN AT KENYATTA NATIONAL HOSPITAL

A. K. Amadi and F. Owilla

ABSTRACT

Introduction: **Infertility is defined as a failure to achieve a clinical pregnancy after 12 months or more of regular unprotected sexual intercourse(1)(2). Overall, 30% of infertility prevalence is attributed exclusively to male factors, 35% to female factors, 20% to both female and male factors while 15% remains unexplained(5)(3). Therefore, male factor infertility is at least partly responsible for 50% of the cases of infertility(3). This study aimed to identify and describe the causes and pattern of presentation of male factor infertility at the Kenyatta National Hospital.**

Materials and Methodology: **The study was a cross-sectional study. The study was conducted at the Kenyatta National Hospital, a National teaching and referral (Level 6) hospital in Kenya.The study population was all the patients with male factor infertility that attended the urological, gynaecological and doctors' plaza clinics at the Kenyatta National Hospital over a period of 7 months. A pre-tested, structured and close- ended questionnaire was administered. Additional information was obtained from patient case notes.**

Results: **60.5% of male factor infertility to be due to unexplained factors, 31.6% due to varicoceles, 2.6% due to congenital factors (zinner syndrome) and 5.2% due to ejaculatory duct obstruction.**

Conclusion: **Male factor infertility is a common and distressing condition. Difficulties in the accurate diagnosis of male reproductive dysfunction complicates our understanding of the epidemiology and aetiology of the condition. Further research with a larger sample size will allow for computation of associations and allow for generalization of data.**

INTRODUCTION

Infertility is defined as a failure to achieve a clinical pregnancy after 12 months or more of regular unprotected sexual intercourse(1)(2). Overall, 30% of infertility prevalence is attributed exclusively to male factors, 35% to female factors, 20% to both female and male factors while 15% remains unexplained(5)(3). Therefore, male factor infertility is at least partly responsible for 50% of the cases of infertility(3).

A Kenyan national infertility survey carried out in 2005 showed that infertility cases contributed to approximately 30% and 15% of of gynecological consultations at national referral and district hospitals respectively. The prevalence and pattern of infertility in a population varies depending on sociocultural differences, the degree of promiscuity, prevalence of sexually transmitted infections and reproductive health behaviour.

Globally, the commonest cause of reversible male factor infertility is varicocele(17). Other causes of male factor fertility include obstruction, cryptorchidism, immunologic causes, ejaculatory failure, endocrinological causes, drugs and radiation, genetic causes, testicular failure, sexual dysfunction, pyospermia, cancer, systemic diseases, infections such as lepromatous and tuberculous leprosy, testicular torsion and ultrastructural defects(18).

Male factor infertility in Kenya has been shown to be associated with tropical diseases such as Bancroftian microfiliarisis, leprosy, tuberculosis and schistomiasis(13). In another local study it was found that 49% of azoospermic males at Kenyatta National Hospital had a palpable epididymal abnormality, with 11% having varicocele, leading to the conclusion that the commonest cause of azoospermia in KNH was obstructive lesions mostly arising from consequence of urogenital infection(13). Riding a bicycle with a nasal seat, has also been associated with erectile dysfunction and infertility in western Kenya(19). Conditions that are associated with male infertility are still widely underdiagnosed and undertreated.

Sub Saharan Africa has a high fertility and population growth rate, which masks the true picture of infertility. Cultural beliefs place a large burden of infertility on the female partner, and practices such as polygamy contribute to discordancy, thus contributing to under-investigation and under-reporting of male factor infertility. Therefore, males who present to fertility and gynaecology clinics as part of a couple represent only a small proportion of the total population with male factor infertility. This has contributed to the lack of data on male factor infertility in Sub Saharan Africa.

Locally, there has been no study that has exclusively focused on causes and presentation of male factor infertility. This study aims to provide baseline information on male factor infertility and prompt further scientific study on the topic. Assumptions are that the causes and pattern of male factor infertility may differ from other studies that have focused on the couple, and that the burden of varicocele- related infertility may be underreported.

MATERIALS AND METHODS

The study was a cross sectional study conducted at the Kenyatta National Hospital (KNH). This is a national referral (Level 6) hospital that also serves as a teaching hospital for the University of Nairobi, School of Medicine. The hospital offers comprehensive services including, general surgery, obstetrics and gynecology clinics and specialty clinics such as urological clinics and fertility clinics. The study population was all the patients with male

factor infertility that attended the urological, gynaecological and doctors' plaza clinics at the KNH between June 2019 and August 2019. A sample size of 38 was arrived at based on the Cochrane's formula of proportions and based on the number of patients who had attended the urology clinic at the KNH in 2018. Following the Kenyatta National Hospital-University of Nairobi ethical approval, the study participants were recruited using a non-randomized consecutive sampling of all the eligible patients. All patients with a confirmed diagnosis of male factor infertility who consented to participate in the study were enrolled. Patients who were clinically too ill and therefore unstable were excluded in the study.

Data collection was carried out by the principal investigator and a research assistant who administered a pre-tested, structured, close- ended questionnaire. More information was obtained from case notes after the patient had been attended to. The quality of the data was continuously assessed at all steps of data collection, entry and analysis, and consistency checks continuously conducted. Data cleaning was done on a daily basis and data uploaded into a password protected excel sheet. The study participants did not incur extra financial costs as a result of participation, and the principal investigator did not benefit in monetary terms from this study.

The collected data was cleaned, coded and analysed by use of the Statistical Package for Social Sciences version 22.0 (SPSS 22.0). Continuous variables such as age were summarized by using means and standard deviations. Comparison of continuous variables was done using the student t-test for normally distributed variables. Categorical variables such as sex, occupation, level of school attended was summarized by use of proportions, frequency tables and graphs where applicable. The associations of categorical variables was demonstrated by use of the chi square tests and all statistical tests were performed at 5% significance level (95% confidence level). Patients' characteristics were represented in the form of tables which illustrated the distribution of social, economic demographic and reproductive health characteristics.

RESULTS

The mean age was 34.7 years (standard deviation - 4.8). Thirty - six (95%) were married and 34 (89.4%) had acquired either college or university level of education. Twenty - four (63.5%) were employed, 12 (31.6%) were self-employed while 2 (5.3%) were unemployed. Twenty - seven (71.5%) participants had sex at least once per week, 10 (26.3%) had sex at least twice per month and 1 (2.6%) had sex less than twice a month.

Eight (21.1%) had fathered a child in the past. Twelve (31.6%) reported a history of alcohol intake while none indicated a history of cigarette smoking or use of drugs of abuse. Two (5.3%) had a history of urethral discharge. None had a history of mumps, scrotal swelling, acute testicular pain, trauma to the groin or surgery in the groin. There was also no history of chronic illness or use of long-term medication. One (02.6%) participant had a history of Zinner syndrome.

Participants with inadequate erection were 06 (15.8%) and all respondents had a normal ejaculation. Twelve (32.3%) participants had a varicocele. None of the respondents had an un descendent testis or a testicular mass. All participants had a palpable vas deferens. Two (05.3%) participants had a transrectal ultrasound done. Of these, 1 (02.6%) had ejaculatory duct obstruction and 1 (02.6%) had a left ejaculatory duct obstruction. Thirty-eight participants consented for a semen analysis: 8 (21.1%) had Asthenozoospermia , 5 (13.2%) had both

Asthenozoospermia and Oligozoospermia, 11 (28.9%) had Azoospermia and 14 (36.8%) had Oligospermia.

Thirty – five respondents had a hormonal profile conducted. One (02.6%) had mild testosterone deficiency, 31 (81.6%) had normal levels. Seven (18.4%) participants had a testicular biopsy done. Of these, 01 (14.2%) had few mature spermatozoa and 06 (85.8%) had maturation arrest.

Table 1

Socio Demographic and Medical Characteristics

Variable		Frequency	Percentage
Level of Education (38)	Secondary	04	10.6
	College	13	34.2
	University	21	55.2
Occupation (n=38)	Employed	24	63.5
	Self Employed	12	31.6
	Un employed	02	05.3

Table 2

Environmental and Social Exposures

Variable	Response	Frequency	Percentage
History of Smoking (n=38)	No	38	100
	Yes	00	00
History of Alcohol intake (n=38)	No	26	68.4
	Yes	12	31.6
History of Drug Abuse (n=37)	No	37	100
	Yes	00	00

Table 3

Clinical Characteristics: Past History of Exposure to Predisposing factors

Variable	Response	Frequency	Percentage
Ever Impregnated	No	30	78.9
	Yes	08	21.1
Hx of Urethral Discharge	No	36	94.7
	Yes	02	05.3
Hx of Mumps	No	38	100
	Yes	00	00
Hx of Scrotal Swelling	No	38	100
	Yes	00	00
Hx of Acute testicular pain	No	38	100
	Yes	00	00
Hx of Trauma to the Groin	No	38	100
	Yes	00	00
Hx of Chronic Illness	No	38	100
	Yes	00	00
Use of Long Term Medication	No	38	100
	Yes	00	00
Hx of Surgery of the Groin	No	38	100
	Yes	00	00
Hx of Congenital Syndrome	No	37	97.4
	Yes	01	02.6

Zinner Sydrome	No	37	97.4
	Yes	01	02.6

Table 4

Frequency of Sexual Intercourse

Variable	Frequency	Percent
At least once weekly	01	02.6
At least once weekly	26	68.5
At least twice a month	10	26.3
Less than twice a month	01	02.6

Table 5

Clinical Characteristics

Variable		Frequency	Percentage
Erection	Inadequate	06	15.8
	Normal	32	84.2
Ejaculation	Normal	38	100
	Abnormal	00	00
Varicocele	No	25	67.5
	Yes	12	32.3
Un descended testis	No	38	100
	Yes	00	00
Testicular mass	No	38	100
	Yes	00	00
Palpable Vas Deferens	No	01	02.6
	Yes	37	97.4
Seminalysis done	No	38	100
	Yes	00	00
Seminalysis results	Asterozoospermia	01	02.6
	Asthenozoospermia	07	18.4
	Asthenozoospermia + Oligozoospermia	05	13.2
	Azoospermia	11	28.9
	Oligozoospermia	14	36.8
Hormonal profile done	No	03	07.9
	Yes	35	92.1
Specificity	Mild	01	02.6
	Mild testosterone	01	02.6
	Normal	31	81.6
	Slight testosterone	01	02.6
Testicular Biopsy Done	No	31	81.6
	Yes	07	18.4
Outcomes of the Biopsy	Few Mature Spermatozoa	01	14.2
	Maturation	06	85.8
Transrectal Ultrasound Done	No	36	94.7
	Yes	02	05.3
Ultrasound Results	Ejaculatory Duct Obstruction	01	
	Left ejaculatory duct	01	

DISCUSSION

A hospital based descriptive study was carried out from January to July 2019 to determine the causes and pattern of presentation of male factor infertility as seen at Kenyatta National Hospital in Nairobi, Kenya. This study found 60.5% of male factor infertility to be due to unexplained factors, 31.6% due to varicoceles, 2.6% due to congenital factors (zinner syndrome) and 5.2% due to ejaculatory duct obstruction. This compares with the global data on varicoceles as a cause of infertility whereby it has been shown that varicoceles are found in 19 to 41% of men with infertility(22). The rate of unexplained infertility appeared to be high (60.5%) as compared to a global estimate of 50%(1). This can be attributed by the fact that majority of the cases of male factor infertility are mostly caused by an intratesticular disorder(1). Also about 10% of male factor infertility is due to chromosomal translocations and this information was not available amongst the study subjects(1).

The mean age of the study population was 34.7 years. This compares well with a study done by Meacham et al whereby he found that most of the patients seeking ambulatory surgery visits for males with infertility were between the ages of 18 – 34 years(16). Most of the patients were married 95% whereas only 5% were not married. Those patients who were single had an obvious cause of reduced fertility i.e. varicocele. Most of the male factor infertility patients had primary infertility (78.9%) as opposed to (21.1%) who presented with secondary infertility. This varies as compared to a local study done by Gachara et al who found that 65% of couples had secondary infertility whereas 35 % of couples have primary infertility(13). The difference could be due to the component that the female factor infertility is involved when infertility is studied amongst a couple.

On the clinical characteristics which may implicate a risk factor towards the subject's status of infertility, only 2 patients were found to have a history of a urethral discharge (implicating infections). None of the subjects had a history of mumps, scrotal swelling, acute testicular pains, testicular trauma, chronic illness, long term medication or surgery to the groin. This thus resulted to the high numbers of subjects with unexplained infertility (60.5%) that was discussed earlier.

Since infertility can be described as the inability to become pregnant after 12 months of regular unprotected sexual intercourse with the same partner(8), the frequency of sexual intercourse amongst the couple plays a significant factor to their fertility status. 71.5% of subjects reported a frequency of having sexual intercourse at least once weekly, 26.3% reported having sexual intercourse at least twice a month whereas only 2.6% reported of having sexual intercourse less than twice a month. In reproductive aged couples, intercourse frequency plays a significant role in determining couple fecundity(39). The median sexual intercourse frequency amongst couples trying to conceive during follow-up was found to be 6 (4–9) acts per month which compares well with our findings(39).

Semen analysis remains the single most useful and fundamental investigation in the search for the cause of male factor infertility. It is a simple test which assesses the formation and maturity of sperm as well as how the sperm interacts with the seminal fluid so it provides insight not only on sperm production (count), but sperm quality (motility, morphology) as well(5). Semen analysis was done on all the subjects who were included in the study. oligozoospermia was found to be the commonest abnormality at 36.8%, azoospermia at 28.9%, asthenozoospermia at 8% and a combination of oligozoospermia and asthenozoospermia

at 13.2%. In a local study on semen characteristics on male partners of couples with infertility, 48.1% were found to have normozoospermia, 2.5% normozoospermia with agglutination, 41.8% teratozoospermia with oligozoospermia and 7.6% with azoospermia(13). This shows a contrasting picture from our findings and it may be due to the study being conducted amongst infertile couples.

Amongst the 11 subjects with azoospermia, 7 underwent testicular biopsy whereby 6 subjects had a biopsy result of sperm maturation arrest whereas one of the subjects had few mature spermatozoa seen in the biopsy. Two of the azoospermic subjects underwent transrectal ultrasound which revealed ejaculatory duct obstruction.

Other significant findings from this study were that 15.8% of males had erectile dysfunction but none had inadequate ejaculation. Hormonal levels were normal in 92.1% of the participants whereas those with abnormalities only had mildly low levels of testosterone with normal LH and FSH levels. These results clearly highlight the urgent need for an andrology unit whereby male factor infertility patients can be followed up and treated.

The main limitations of this study were that being a hospital-based study, its findings might not be generalizable to the larger population. There was possible quality variability in the laboratory evaluation of semen even though only results from laboratories which used the WHO guidelines were included. Further, the small sample size does not allow computation of any associations thus analysis was mainly on frequencies.

CONCLUSION

Male factor infertility is a common and distressing condition. Difficulties in the accurate diagnosis of male reproductive dysfunction complicates our understanding of the epidemiology and aetiology of the condition. It is recommended that facilities are established that are capable of diagnosing and managing male factor infertility, that Assisted Reproductive technology be introduced in Kenyatta National hospital to aid in the management of infertility and that health education on male factor infertility in the community is increased to create awareness in the general public. Further, training of andrologists will increase the human resource capital available for managing the condition. Despite its limitations, this study provides a basis for further scientific research on male factor infertility in our setup. Further research with a larger sample size will allow for computation of associations and allow generalisation of data.

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