



African Journal of Urology

Official journal of the Pan African Urological Surgeon's Association
web page of the journal

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Andrology/Male Genital Disorders

Original article

Male infertility: An audit of 70 cases in a single centre



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Received 31 August 2015; received in revised form 27 October 2015; accepted 28 October 2015

Available online 25 July 2016

KEYWORDS

Male;
Infertility;
Varicocele;
Concentration;
Motility

Abstract

Objectives: To audit the aetiology, treatment and predictors of outcome in infertile men who attended urology clinic of a private hospital in Lagos, Nigeria.

Patients and Methods: A ten-year retrospective review of all male infertility cases managed in our facility. Data on the demography, presentations, clinical findings, aetiologies, investigations, treatments and outcomes of all patients seen over the study period were retrieved and analyzed.

Results: A total of 70 married men were managed for male factor infertility with mean age of 35.6 years. Forty-four (62.9%) had primary while 26 (37.1%) had secondary infertility. The commonest aetiology of male infertility was varicocele in 53 (75.7%) followed by testicular atrophy in 9 (12.9%) patients. Varicocelectomy was done in 52 (74.3%), vaso-vasostomy in 3 (4.3%) and medical therapy in 15 (21.4%) of the patients. There was significant difference between the mean pre- and post-treatment sperm concentration and motility. Following treatment, sixteen (22.9%) and 31 (44.3%) patients had improvement in their sperm concentration and motility respectively out of which 13 (18.6%) achieved pregnancy. The mean post-treatment sperm concentration and motility in those who achieved pregnancy were 35.7 millions/ml and 68.5%, respectively. In those who had varicocelectomy, the sperm concentration and motility were increased in 34 (77.3%) and 23 (53.5%), reduced in 4 (9.1%) and 11 (25.6%) and unchanged in 6 (13.6%) and 9 (20.9%), respectively. All the patients who achieved pregnancy were those who had varicocelectomy representing 25% of those patients who had varicocelectomy.

Conclusion: Varicocele represents the most common treatable cause of male factor infertility and treatment is accompanied with improved seminal fluid parameters as well pregnancy rate. Post-treatment sperm concentration and motility were the only factors that could predict the possibility of achieving pregnancy.

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Peer review under responsibility of Pan African Urological Surgeons' Association.

<http://dx.doi.org/10.1016/j.afju.2015.10.003>

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Introduction

Infertility is a disease of the reproductive system defined by the failure to achieve a clinical pregnancy after 12 months or more of regular unprotected sexual intercourse. Clinical pregnancy on the other hand is a pregnancy diagnosed by ultrasonographic visualization of one or more gestational sacs or definitive clinical signs of pregnancy, including ectopic pregnancy [1]. Primary infertility is when a woman has never conceived despite cohabitation, exposure to pregnancy, and the wish to become pregnant for at least 12 months, whereas, secondary infertility is when a woman has previously conceived but is subsequently unable to conceive despite cohabitation, exposure to pregnancy, and wish to become pregnant for at least 12 months. If the woman has breastfed a previous infant, then exposure to pregnancy should be calculated from the onset of regular menstruation following delivery [2]. Once thought to be the disease of women, it is now clear that cause(s) of infertility in couples can be found in the male partner, female partner, both partners or neither partners (unexplained infertility) [3]. Infertility is a global reproductive health problem, however, its burden is higher in developing countries. Apart from the fact that more infertile couples live in the third world, infertility in this region is associated with more social stigmatization, derogatory names, economic challenges (both from the cost of managing the disease and the cost of assisted reproductive technology) and divorce [4]. Compared to the western world, infertile couple in the third world feel a deeper sense of shame, guilt, worthlessness, depression and loss of inheritance especially in areas where there is belief that once names will soon be forgotten after death [5,6].

About 15% of couples do not achieve pregnancy in one year thereby seeking medical therapy [7]. In African societies, women are often blamed for infertility and are usually left on their own to seek for solution from many sources ranging from spiritual to orthodox [8,9]. Studies in our environment have shown that male factor could account for nearly 50% of infertility cases [3,10]. The contribution of male factor to infertility may even be underestimated in our environment as many men would not seek medical help due to poor education, cultural beliefs and male chauvinism [11].

The objective of this study is to audit the aetiology, outcome and predictors of outcome in infertile men who attended urology clinic of a private hospital in Lagos, Nigeria over a ten-year period.

Patients and methods

This is a retrospective study of 70 patients who were managed for male factor infertility at the urology clinic of Lagoon hospital Apapa, Lagos over a 10-year period between January 1999 and December 2008. Most of our patients presented by themselves with complaint of infertility due to high level of literacy in our patients. Lagoon hospital is a specialist-based health institution located in the southern part of the cosmopolitan city of Lagos with a clientele comprising of middle and low-income working class. Approval for the study was obtained from the Research and Ethics Committee of the hospital. Semen analysis was done using the WHO manual, fourth edition [1999]; varicocele was diagnosed clinically and confirmed by Doppler Ultrasound (USS) of the scrotum; vas obstruction was diagnosed with vasography; testicular atrophy was diagnosed clinically and was confirmed with ultrasound scan as total testicular volume less than 30 ml and also by testicular biopsy. Testicular biopsy was done only in those with azoospermia. Data on

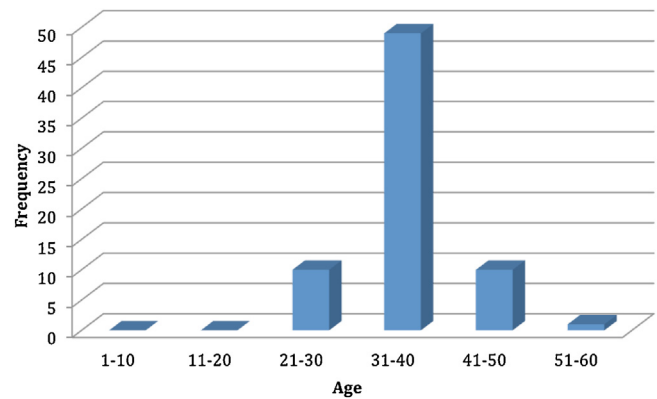


Fig. 1 Age distribution of patients.

the demography, presentations, clinical findings, aetiology, investigations, treatments and outcomes of all patients seen over the study period were retrieved from the case notes and analyzed using Statistical Package for Social Sciences version 21. Results were presented in tables using simple proportion and comparison were made between various means using paired sample *t*-test with the level of significance set at *p*-value of <0.05.

Results

A total of 70 married men were managed for male factor infertility over the study period with the mean, median and range of patients' age being 35.6 ± 4.8 , 35.0, and 26–54 years respectively. The peak age incidence was 31–40 years comprising of 70% of all the patients managed during this period (Fig. 1).

Of the 70 patients, 44 patients (62.9%) had primary infertility while 26 (37.1%) had secondary infertility. The commonest identifiable pathology of male infertility in our study was varicocele in 53 patients (75.7%). Of these, 36 (51.4%) had bilateral varicocele, whereas, 17 (24.3) had unilateral varicocele. Unilateral varicocele was commoner on the left side, 15 (88.2%) compared to the right, 2 (11.8%). It occurred alone in 30 patients (42.9%), in combination with hormonal imbalance in 22 (31.4.0%) and in combination with vas occlusion in 1 (1.4%), followed by testicular atrophy in 9 (12.9%). Other aetiological factors include hormonal imbalance alone in 3 (4.3%), vasal obstruction alone in 2 (2.9%), chromosomal abnormality (XXY) in 1 (1.4%), dysfunction (retrograde ejaculation) in 1 (1.4%) and idiopathic in 1 patient (1.4%) (Table 1).

The pattern of hormonal analysis (testosterone, luteinizing hormone, follicle stimulating hormone and prolactin) of the patients revealed normal result in 49 patients (70%), primary testicular failure in 8 (11.4%), hyperprolactinaemia in 8 (11.4%) and androgen resistance in 1 patient (1.4%) (Table 2).

The sperm concentration at presentation was abnormal in 67 patients (95.7%), motility was abnormal in 45 (64.3%), both sperm concentration and motility were abnormal in 19 (27.1%), azoospermia was observed in 25 (35.7%), whereas, 2 patients (2.9%) had both normal sperm concentration and motility. The sperm concentration and motility ranged from 0 to 24 million/ml and 0–85% with mean of 4.3 ± 6.0 million/ml and $28.0 \pm 30.5\%$, respectively. Open varicocelectomy through an inguinal approach (Ivannisevich) was done in 52 (74.3%), vaso-vasostomy in 3 (4.3%) and medical therapy in 15 (21.4%) of the patients. Medical therapies given to the patients

Table 1 Distribution of aetiological factors.

Aetiology	N	%
Varicocele	30	42.9
Varicocele + Hormonal imbalance	22	31.4
Testicular Atrophy	9	12.9
Hormonal Imbalance	3	4.3
Vas Occlusion	2	2.9
Varicocele + Vas occlusion	1	1.4
Chromosomal (XXY)	1	1.4
Ejaculatory Dysfunction	1	1.4
Idiopathic	1	1.4
Total	70	100

include bromocriptine, testosterone, tamoxifen and antibiotics. The post-treatment sperm concentration and motility ranged from 0 to 69 millions/ml and 0–89% with mean of 13.0 ± 15.6 million/ml and $42.4 \pm 32.7\%$, respectively. The mean difference between the pre- and post-treatment sperm concentration and motility were 8.6 ± 13.2 million/ml and $14.4 \pm 27.5\%$, respectively. These differences were statistically significant (using paired sample *t*-test) with *p*-values of both being 0.000 ($p < 0.05$).

Out of the 70 patients, 16 (22.9%) and 31 (44.3%) had improvement in their sperm concentration and motility respectively to normal level. All the patients who had improvement in their sperm concentration and motility to normal level were those who had varicocelelectomy. The mean post-treatment sperm concentration and motility in those who achieved pregnancy were 35.7 ± 16.7 millions/ml and $68.5 \pm 15.3\%$, respectively while they were 6.9 ± 7.9 million/ml and $35.1 \pm 32.2\%$, respectively in those who did not achieve pregnancy. The difference in the sperm concentration and motility between these two groups was statistically significant with *p*-values of 0.000 for both sperm concentration and motility. The mean of increase in the sperm concentration and motility achieved after treatment in those that achieved pregnancy were 26.8 ± 17.5 million/ml and $20.2 \pm 31.6\%$, respectively while they were 3.7 ± 5.6 and $12.8 \pm 26.5\%$, respectively in those who could not achieve pregnancy.

The independent sample *t*-Test analysis showed that the mean of increase in sperm concentration in the pregnant group was statistically significantly higher than in the non-pregnant group (*p*-value of 0.001) while there was no statistically significant difference in the mean increase in motility between the pregnant and the non-pregnant group.

Table 2 Endocrine profile of patients.

Condition	Hormone level				N	%
	T	FSH	LH	PRL		
Normal	NL	NL	NL	NL	49	70.0
Primary Testicular Failure	Low	High	High/NL	NL	8	11.4
Hyperprolactinemia	Low	Low/NL	Low	High	8	11.4
Androgen Resistance	High	High	High	NL	1	1.4
Hypogonadotropic Hypogonadism	Low	Low	Low	NL	0	0.0
Missing value					4	5.7
Total					70	100

T: testosterone; FSH: follicle stimulating hormone; LH: luteinizing hormone; PRL: prolactin hormone; NL: normal.

Table 3 Treatment modality versus pregnancy outcome.

Treatment Group	Outcome Group		Total
	Wife pregnant	Wife not pregnant	
Varicocelelectomy	13 (25)	39 (75)	52 (100)
Vaso-vasostomy	0 (0)	3 (100)	3 (100)
Medical therapy	0 (0)	15 (100)	15 (100)
Total	13 (18.6)	57 (81.4)	70 (100)

In those who had varicocelelectomy, the sperm concentration and motility were increased in 34 (77.3%) and 23 (53.5%), reduced in 4 (9.1%) and 11 (25.6%) and unchanged in 6 (13.6%) and 9 (20.9%) patients, respectively. All the patients who achieved pregnancy were those who had varicocelelectomy representing 25% of those patients who had varicocelelectomy (Table 3). All of those who achieved pregnancy after varicocelelectomy also had increase in sperm concentration but sperm motility was only increased in 8 (66.7%) of them. Out of the 70 patients in this study, 13 (18.6%) achieved clinical pregnancy diagnosed by ultrasonography (Table 3), 38 (54.3%) were referred for assisted reproductive technology while 19 (27.1%) were lost to follow up.

Discussion

Male infertility remains a great challenge to urologist especially in the developing world where assisted reproductive technology is often not available and where available, out of the reach of common men [12,13]. The age range of 26–54 and peak incidence of 31–40 in our study is similar to those quoted by other researchers on infertility in Nigeria [12]. Most of our patients (62.9%), had primary infertility which is in agreement with other reports [12]. Varicocele is the commonest pathology of male factor infertility in our study, either alone or in combination with other factors and was responsible for 75.7% of male factor infertility. This is similar to the findings reported by Nwofor and Ugezu [12] in the south eastern part of Nigeria.

Sex hormone assay was routinely done in our patients and the results were prompt and reliable, this is contrary to the report in some part of Nigeria that hormonal analysis were not readily available and when done in some private facility, the result takes longer than necessary and may be unreliable [12]. A total of 66 (93.4%) of our patients had sex hormonal assay. Preponderance (70%) of our patient had normal hormone profile. The endocrine profile of 13 patients who achieved pregnancy showed that intact endocrine profile might be an

important factor in achieving normal sperm profile and subsequent pregnancy as 10 (83.3%) of those who achieved pregnancy had normal hormone profile.

Irrespective of the aetiology, oligozoospermia and asthenozoospermia have been established as the major seminal fluid analysis patterns seen in male factor infertility [3]. Corroborating this, our study showed that of all the factors compared between the patients who achieved pregnancy and those who could not achieve pregnancy, sperm concentration and motility were the only factors that were statistically and significantly different. The mean post-treatment sperm concentration and motility in the pregnant group were 35.7 ± 16.7 million/ml and $68.5 \pm 15.3\%$, respectively which are within the World Health Organization (WHO) reference values for normal sperm concentration and motility [14]. Those who did not achieve pregnancy had significant increase in their sperm concentration and fertility profile, which might improve their chances at assisted reproductive technology.

Varicocelectomy afforded a significantly higher increase in the sperm concentration and motility compared to other forms of interventions. This was why all the patients in our study who achieved pregnancy were those who had varicocelectomy. There is a wide variation in the pregnancy rate reported across Nigeria. Overall pregnancy rate in our study was 18.6%, a lower pregnancy rate was reported by a similar study done in the south-eastern part of Nigeria [12] while Osifo and Agbugui [15] reported a pregnancy rate of 69.7% from Benin. The moderate pregnancy rate in our study might be due to a higher sample size, heterogeneous ethnicity of our study population and the multiple aetiological factors captured by our study.

There is high attrition rate due to the frustrating outcome of management of male infertility. More than a quarter (27.1%) of the patients in our study were lost to follow up, higher attrition rate has been reported by other studies with many patients engaging in 'doctor shopping' due to lack of patience and perseverance on the part of the patients and pressure from the family members to seek help from churches and traditional homes [12,13].

Conclusion

Male factor infertility is a huge challenge in Nigeria. Primary infertility was commoner than secondary infertility. Varicocele represented the commonest treatable cause of both primary and secondary male factor infertility in our study. Post-treatment sperm concentration and motility were the only factors that could predict the possibility of achieving pregnancy. There is high attrition rate due to discouraging treatment outcome. We hereby recommend that there should be human capacity development in assisted reproductive technology as well as subsidy on the equipment and drugs required to allow many poor Nigerians to have opportunity to avail themselves of the benefit it affords. Furthermore, there should be increased awareness and education on varicocele with the aim of achieving early presentation and treatment of this correctable cause of male infertility.

Ethical committee approval

This work was reviewed and approved by Hospital Research and Ethics Committee of Lagoon Hospital Limited, Apapa, Lagos.

Conflict of interest

The authors declare that there is no conflict of interest.

Funding

Nil.

Authors' contributions

E.A. Jeje: Concept and Research Design, Data Acquisition, Data Analysis and Interpretation, Drafting the manuscript and Critical review of the manuscript.

T.O. Alabi: Data Analysis and Interpretation, Drafting the manuscript.

R.W. Ojewola: Drafting the manuscript and Critical review of the manuscript.

M.A. Ogunjimi: Data Acquisition, Data Analysis and Interpretation.

S.A. Osunkoya: Concept and Research Design, Data Acquisition.

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