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Original Research Article

Pattern of infertility among infertile couples in a tertiary health institution in Bayelsa State, South-South Nigeria

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ABSTRACT

Background: Infertility is a socially distressing medical condition that remains a public health concern in many developing countries, including Nigeria. The objective of the study was to evaluate the pattern of infertility among infertile couples in a tertiary hospital in South-South Nigeria.
Methods: A retrospective, descriptive, cross-sectional study of infertile couples evaluated at the Infertility Clinic of the Federal Medical Centre, Yenagoa, Bayelsa State, South-South Nigeria, between January and December, 2021, was conducted. Case records of all the infertile couples evaluated during the study period were retrieved, and relevant data were extracted from the case records using a pre-designed proforma. Data obtained was analysed using Statistical Product and Service Solutions for Windows® version 25 (SPSS Inc.; Chicago, USA).
Results: The incidence rate of infertility was 18.2%. Tubal factor was the most common (104, 55.6%) cause of infertility, with tubal blockage being the commonest (92, 49.2%) tubal pathology. Male factor was implicated in 81, 43.3%, of the cases, a combination of male and female factors in 45, 24.1%, while 5, 2.7%, of the cases were unexplained. Female factor alone was responsible for infertility in 101, 54.0%, of the cases, while male factor alone was identified in 36, 19.2%, of the cases.
Conclusions: Our study's incidence rate for infertility was similar to those reported in other studies in our region. To reduce the incidence of infertility, social reorientation to improve sociocultural practices and poor health-seeking behaviour of couples, should be pursued vigorously.

Keywords: Infertility, Incidence, Couple, Tubal, South-South, Nigeria

INTRODUCTION

Infertility is defined as the inability of a cohabiting couple to conceive after one year of adequate and regular unprotected, peno-vaginal sexual intercourse.[1] Globally, infertility affects 8%–15% of couples.[2,3] Thirty percent of cases are solely attributable to a male factor, 30% to female factors, and combined male and female factors in up to 30%; others are unexplained.[4–6] The most common reversible cause of male factor infertility is varicocele.[4] The most common causes of female infertility include anovulation (polycystic ovary syndrome being the most common cause), tubal disease, pelvic adhesions, and endometrisosis.[7]

Primary infertility is when a couple has never conceived despite 12 months or more of adequate unprotected sexual intercourse, whereas in secondary infertility, the couple has previously conceived, but is subsequently unable to conceive despite adequate unprotected sexual intercourse for at least 12 months.[8] Women in developed countries tend to suffer primary infertility predominantly. In contrast, higher rates of secondary infertility are seen in developing countries, reflecting the high prevalence of tubal disease from sexually transmitted, post-abortion and puerperal infections in these countries, the most commonly implicated organisms being Chlamydia trachomatis and Neisseria gonorrhoeae.[9–11]

The woman's age is the single most important factor influencing a couple's ability to conceive.[12] Female fertility begins to decline after 30 years of age, drops quite rapidly after 35 years, and precipitously declines after 40 years, owing to a decline in both the quantity and quality of ovarian follicles.[4,12,13] A World Health Organization (WHO) Study of over 5,800 couples in 33 centres in 25 countries, revealed that whereas 42% of infertile women in developing countries were 24 years or younger, this age range represented only 25% of infertile women in developed countries.[11] This is explained by the fact that whereas more women in the developed world are delaying childbearing for various reasons including career, the world's highest total fertility rates are found in Africa and other developing regions, where early marriages are common, and there is little voluntary effort to postpone childbearing.[9]

The World Health Organization (WHO) Study also found that whereas nearly one-half of couples in developed countries sought medical evaluation within less than two years of infertility, over two-thirds of those in developing countries presented after more than 2.5 years of infertility.[11] Infertile women in developing countries often first wait passively, consult general practitioners, or patronize alternative/unorthodox medicine providers, before seeking specialist care for infertility.[14] This study sought to evaluate the pattern of infertility among infertile couples at the Federal Medical Centre, Yenagoa, in Bayelsa State, South-South Nigeria.

METHODS

A retrospective, descriptive, cross-sectional study of infertile couples seen at the Infertility Clinic of the Federal Medical Centre, Yenagoa, Bayelsa State, Nigeria, was conducted. Case records of all the infertile couples that presented to the Infertility Clinic for evaluation, from January to December, 2021, were retrieved, and relevant data, which included age, religion, level of education, State of residence, occupation, parity, number of children alive, age at menarche, type of infertility, duration of marriage, duration of infertility and causes of infertility, were extracted from the case records using a pre-designed proforma, for data analysis. Patients that presented with complaints other than inability to conceive were excluded from the study.

Investigations requested included hormone profile, hysterosalpingography, transvaginal ultrasound scan and seminal fluid analysis. Hormone profile (day 3 prolactin, follicle stimulating hormone, luteinizing hormone, oestrogen, testosterone and day 21 progesterone) was used to assess ovarian reserve, and confirm ovulation. Thyroid function tests were done when there was clinical suspicion of thyroid disease. Hysterosalpingography was used to assess for tubal pathologies and intrauterine adhesions, while transvaginal ultrasound scan was used to assess for polycystic ovaries, endometrial plate, leiomyoma and other pelvic pathologies. Seminal fluid analysis was used to assess for male factor infertility, using the World Health Organisation 2010 criteria.[15] Treatment was based on results of at least two seminal fluid analyses done at least four weeks apart.

Collected data were analysed using Statistical Product and Service Solutions for Windows® version 25 (SPSS Inc.; Chicago, USA). Analysis of categorical variables was presented in frequencies and percentages, while analysis of continuous variables was presented in mean and standard deviation.

Ethical approval for this study was obtained from the Hospital's Ethics and Research Committee.

RESULTS

Sociodemographic characteristics of infertile women

Within the study period, 187 couples were evaluated for infertility, out of 1,027 gynaecological patients, giving an infertility incidence rate of 18.2%. The mean age of the women was 33.7±5.9 years, with a modal (55, 29.4%) age group of 26-30 years. Majority of the women were Christians (184, 98.4%), who resided in Bayelsa State (170, 90.9%). Eighty-seven (46.5%) and 84 (44.9%) of the women had secondary and tertiary level education, respectively. Most of the women were traders (77, 41.2%); others were civil servants (41, 21.9%), and professionals (16, 8.6%), while 42 (22.5%) of the women were unemployed. The mean duration of marriage was 5.5±3.9 years. These sociodemographic characteristics are shown in Table 1.

Gynaecological characteristics of infertile women

The parity of the women ranged between 0 and 4, with a median of 0. Most (100, 53.5%) of the women were nulliparous. The mean age at menarche of the women was 13.3±1.5 years. Secondary infertility (151, 80.7%) was the predominant type of infertility, with most (148, 79.1%) of the women having a duration of infertility of 1-5 years (Table 2).

Aetiology of infertility

Tubal factor was the most common (104, 55.6%) cause of infertility. The most common tubal factor was tubal blockage (92, 49.2%). Male, uterine, and ovarian factors were responsible for infertility in 81 (43.3), 63 (33.7%), and 58 (31.0%) women, respectively. Intrauterine adhesion was present in 20 (10.7%) women.

Table 1: Sociodemographic characteristics of infertile women (n=187).

Characteristics	N	%
Age group (years)		
21–25	11	5.9
26–30	55	29.4
31–35	52	27.8
36–40	43	23.0
>40	26	13.9
Mean age of women ±SD in years	33.7±5.9	
Religion		
Christianity	184	98.4
Islam	3	1.6
Level of education		
Primary	16	8.6
Secondary	87	46.5
Tertiary	84	44.9
Residence		
Bayelsa State	170	90.9
Outside Bayelsa State	17	9.1
Occupation		
Trader	77	41.2
Unemployed	42	22.5
Civil servant	41	21.9
Professional	16	8.6
Security agent	4	2.1
Farmer	3	1.6
Healthcare worker	3	1.6
Artisan	1	0.5
Duration of marriage (years)		
1–5	104	55.6
6–10	69	36.9
>10	14	7.5
Mean duration of marriage±SD in years	5.5±3.9	

Uterine fibroids (in combination with other factors) were seen in 41 (21.9%) women, but solely, they were seen in 14 (7.5%) of the women. Polycystic ovary syndrome (21, 11.2%), ovarian insufficiency (19, 10.2%), and hyperprolactinaemia (18, 9.6%) were the identified ovarian factors.

Overall, female factor infertility was present in 146 (78.1%) of the women. However, female factor alone was responsible for infertility in 101 (54.0%) of cases, while male factor alone was identified in 36 (19.2%) cases. A combination of male and female factors was identified in 45 (24.1%) couples. The cause of infertility was unexplained in 5 (2.7%) couples (Tables 3 and 4).

Table 2: Gynaecological characteristics of infertile women.

Characteristics	N	%
Parity		
Nulliparous	100	53.5
Primiparous	40	21.4
Multiparous	47	25.1
Median Parity (range)	0 (0–4)	
Number of children		
None	111	59.4
1–2	68	36.4
3–4	8	4.3
Median number of children (range)	0 (0–4)	
Age at menarche (years)		
9–12	58	31.0
13–15	117	62.6
>15	12	6.4
Mean age at menarche ±SD in years	13.3±1.5	
Type of infertility		
Primary	36	19.3
Secondary	151	80.7
Duration of infertility (years)		
1–5	148	79.1
6–10	28	15.0
>10	11	5.9
Mean duration of infertility ±SD in year	3.9±3.6	

Table 3: Aetiology of infertility (n=187).

Aetiological factors	N	%
Tubal factor	104	55.6
Tubal blockage	92	49.2
Hydrosalpinx	8	4.3
Peritubal adhesions	3	1.6
Salpingitis isthmica nodosa	1	0.5
Uterine factor	63	33.7
Uterine fibroids	41	21.9
Intrauterine adhesions	20	10.7
Septate uterus	1	0.5
Bicornuate uterus	1	0.5
Ovarian factor	58	31.0
Polycystic ovary syndrome	21	11.2
Ovarian insufficiency	19	10.2
Hyperprolactinaemia	18	9.6
Male factor	81	43.3
Unexplained	5	2.7

*Multiple aetiologies in some couples, hence n>187.

Table 4: Contribution of various factors to infertility (n=187).

Contribution	N	%
Aetiological factors		
Male factor only	36	19.2
Female factor only	101	54.0
Male and female factors	45	24.1
Unexplained	5	2.7
Number of aetiological factors		
Single factor	112	59.9
Two factors	51	27.3
Three factors	16	8.6
All four factors	3	1.6
Unexplained	5	2.7

DISCUSSION

Infertility is a major health condition globally. The incidence varies widely from one region to another, and it is highest in the infertility belt of Africa, of which Nigeria is part.[16] Our study revealed an infertility incidence rate of 18.2%, which was similar to the 18.5% reported by Nwajiaku et al in Nnewi.[17] It was higher than the 15.4% and 12.1%, respectively reported by Obuna et al and Menuba et al both in South-East Nigeria, but lower than the 32.0% reported by Odunvbun et al in South-South Nigeria, 26.8% by Adegbola and Akindele in South-West Nigeria and 23.9% by Dattijo et al in Bauchi, Northern Nigeria. Worldwide, infertility affects 8-15% of couples.[2,3,14,18,19,21] The differences in rates may be related to the sociocultural differences, differences in health-seeking behaviour and genetic makeup of the people residing in the various regions of the world.[22]

The mean age of the women in this study was similar to those reported by Odunvbun et al in South-South Nigeria and Adegbola and Akindele in South-West Nigeria, but higher than the mean reported by Dattijo et al in Bauchi, Northern Nigeria.[14,20,21] This is a reflection of the lower age at marriage that is prevalent in Northern Nigeria. A plausible reason for the age distribution in our study may be due to the fact that many women in our environment have preference for alternative/non-medical care, which includes visit to traditional birth attendants, prayer houses, maternity homes, and other non-orthodox places, before presenting to a specialist for expert care. The ability to conceive declines with increasing age. Factors that may reduce fecundity, such as tubal disease, uterine fibroids, endometriosis and male factor infertility, increase with age. A reduction in coital frequency with increasing age also plays a role.[23] At about 28-30 weeks' gestational age, ovarian follicles are about 7 million. They reduce to 2 million at birth, and then 500,000 at puberty, and continue to decline with age until menopause.

In this study, the most common type of infertility was secondary, and this finding corroborates the reports of many other authors.[19–21,24–28] A plausible explanation for this may be due to post-abortion sepsis and pelvic inflammatory diseases, that may have complicated previous induced abortions. Sexually transmitted infections, post-operative/procedure infections, and puerperal sepsis from previous deliveries supervised by unskilled/traditional birth attendants, which is very common in our environment, may be other plausible reasons for the high proportion of women with secondary infertility in our study.

The mean duration of infertility in our study was 3.9±3.6 years. This was lower than the 5±3 years reported by Odunvbun et al., 4.3±3.4 years reported by Adegbola and Akindele, and 4.1±3 years reported by Ekwere et al.[14,20,29] The duration of infertility and duration of marriage often positively correlate with the age of the woman, as increasing age is associated with a high rate of infertility. The incidence of male factor infertility in our study was 43.3%, which is lower than the 56% reported by Odunvbun et al but higher than the 34.5% reported by Ekwere et al 38.2% reported by Tabong and Adongo, 19.7% reported by Panti and Sununu, and 17.7% reported by Dattijo et al.[20,21,29-31] A wide range of aetiological factors (pre-testicular, testicular and post-testicular) are known to cause male infertility.

Tubal blockage was the commonest (49.2%) cause of infertility in this study. This value was higher than the 42% reported by Odunvbun et al and 63.6% reported by Panti and Sununu.[20,31] Post-abortion sepsis, pelvic inflammatory disease, sexually transmitted infections and puerperal sepsis due to poor health-seeking behaviour of the women in our environment are largely responsible for the high incidence of tubal factor infertility. Uterine factor contributed 33.7% to infertility in our study. Intrauterine adhesions usually arise from overzealous curettage (during intrauterine procedures and unsafe abortion) and endometritis (from post-abortion/puerperal sepsis). Solely, uterine fibroids were present in 7.5% of the infertile women in this study. Uterine fibroid is not a usual cause of infertility. In fact, the role of uterine fibroids in the aetiology of infertility is more of casual than causal.[32] This means that the presence of uterine fibroid is only attributed to infertility when no other cause can be found.

The pattern of contribution of various aetiological factors to infertility in our study was different from those earlier reported from within and outside Nigeria.[4–6,20,33] These variations may have resulted from sociocultural differences, differences in health-seeking behaviour, exposure to environmental toxins which may predispose to infertility, sexually transmitted infections, environmental factors like stress which may inhibit ovulation.

A limitation of this study is that being a single hospital facility-based study, the findings may not be generalizable. We recommend a larger, highly powered,

population-based study, as this will be more representative of the findings in the general population.

CONCLUSION

Our study revealed an infertility incidence rate of 18.2%, which is similar to those reported by other studies in our region. To reduce the incidence of infertility, social reorientation to improve sociocultural practices and the poor health-seeking behaviour of couples, should be pursued vigorously.

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