International Journal of TROPICAL DISEASE & Health

Volume 45, Issue 10, Page 10-17, 2024; Article no.IJTDH.123288
ISSN: 2278–1005, NLM ID: 101632866

Determinants of Infertile of Infertile Women Requesting Assisted Reproduction Techniques in a Low Resource Setting in Western Nigeria

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

Article Information

DOI: https://doi.org/10.9734/ijtdh/2024/v45i101594

Open Peer Review History:
This journal follows the Advanced Open Peer Review policy. Identity of the Reviewers, Editor(s) and additional Reviewers, peer review comments, different versions of the manuscript, comments of the editors, etc are available here: https://www.sdiarticle5.com/review-history/123288

Original Research Article

Received: 04/07/2024
Accepted: 13/09/2024
Published: 17/09/2024

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Cite as: *SI, Omisakin, Ugwu AO, Olamijulo JA, Makwe CC, Oluwole AA, Kusamotu OA, Fagbolagun OA, Lemomu KM, Adejumo TP, Opemuade TI, Martin-Akinlose OD, Awoniyi A, Ogedengbe OK, and Giwa-Osagie OF. 2024. "Determinants of Infertile of Infertile Women Requesting Assisted Reproduction Techniques in a Low Resource Setting in Western Nigeria". International Journal of TROPICAL DISEASE & Health 45 (10):10-17. https://doi.org/10.9734/ijtdh/2024/v45i101594.*

ABSTRACT

Background: Infertility is an important gynaecological condition with psycho-social, cultural, economic, religious, demographic, and clinical consequences. Although the prevalence of couples having problems with conception has remained relatively stable worldwide, there has been an increase in the proportion of couples seeking fertility services. This substantial increase might reflect the improvement in the advancements in fertility care, improved success rates, increased availability of specialists and or involvement of insurance firms in infertility treatment. Paradoxically, countries in Africa with high infertility burden still lags in fertility care. This study was therefore aims to investigate the types and causes of infertility in patients attending fertility care in an assisted conception Centre in a public tertiary hospital in southwest Nigeria**.**

Methods: This was a retrospective study of patient records who attended Assisted fertility centre (AFC) of Lagos University Teaching Hospital (LUTH), from January 1st, 2015, to December 31st, 2023. Categorical variables were analysed using percentages while continuous variables were analysed using mean and standard deviation and the association between categorical variables was analysed using chi-square test. The statistical significance level was set at p-value < 0.05.

Results: The mean age and mean duration of infertility of the participants in the study was 40.89±6.8, and 8.14±3.5 respectively. About 72.9% had more than secondary education while almost two thirds of the participants had secondary infertility, 36.1% had previous pelvic surgeries, 11.4% had chronic pelvic pain and menstrual abnormality. Secondary infertility was more prevalent in women who has chronic pelvic pain, or those who has had previous pelvic surgery, previous infertility or previous abortion.

Conclusion: In conclusion our analysis suggests that Secondary infertility is the commonest cause of inability to conceive in our facility. It also revealed that most of our women present late for fertility care at an advanced maternal age.

Keywords: Female infertility; age; secondary infertility; pelvic surgeries.

1. INTRODUCTION

Infertility is a disease of the male and female reproductive system defined by failure to achieve clinical pregnancy after12 months or more of regular unprotected sexual intercourse [1].

It affects 1 in 6 couples globally [2]. It is estimated that between 48 million couples and 186 million individuals live with infertility globally. Sub-Saharan Africa is among the region with highest of infertility [3,4].

It is a psychologically devastating condition of high magnitude. Sadly, our societal norms dictates that the woman is the cause of the infertility, ignoring the male infertility [5]. The psychological impact is even worrisome in Africa where wealth and family inheritance are sometimes adjudged with large family size [5,6] Undoubtedly these large family sizes are seen as an asset or future investments in many African cultures [6,7].

There are several identifiable causes of subfertility. The prevalence of these factors differs from region to region. While there is data on infertility and it's causes in high income countries, not a lot is available in Sub-Saharan Africa, hence, investigating the type and causes of infertility is highly needed to generate important data important for planning and interventions.

The singular way by which one can have the desired number of children is through access to sexual and reproductive health services. These are still largely unavailable, inaccessible and unaffordable in low and middle income countries [4].

Infertility care by assisted conception until recently, is mainly in the private settings and largely unaffordable by the large number of the people that need it most. A number of government hospitals now offer the services. This, in a way, has increased the accessibility to the service, however most of the services are not funded by the government, patients are therefore left to pay for the fertility treatment on their own unlike what is obtainable in technologically advanced nations [8].

There is paucity of assisted conception units in Nigeria serving a population of over 200 million people. This study was conducted to investigate

the types and causes infertility in patients attending fertility care in an assisted conception centre in a public tertiary hospital in southwest Nigeria.

2. MATERIALS AND METHODS

Study Setting/Design: This was a retrospective study of patient records who attended assisted fertility centre of LUTH from January 1st, 2015, to December 31st, 2023.

Study Population: The participants were female partners of infertile couples who sought care in our facility during the study period.

2.1 Eligibility Criteria

2.1.1 Inclusion criteria

- woman who sought care or had successful treatment during the period of study.

2.2 Exclusion Criteria

Women with incomplete data were excluded from the study.

2.3 Data Analysis

An anonymized excel spreadsheet was designed to collect the relevant information for the study. The data was entered using an excel spreadsheet and later imported and analysed using SPSS Statistics version 29.0 (IBM® SPSS® UK). Personal identifying information were all removed from the data. Categorical variables were analysed using percentages while continuous variables were analysed using mean and standard deviation and the association between categorical variables was analysed using chi-square test. The statistical significance level was set at p-value < 0.05.

3. RESULTS

The data was collected from Assisted Fertility Fenter (AFC) of LUTH. About 244 case records of patients were assessed, only 236 had complete data and were included in analysis.

The mean age and mean duration of infertility of the participants was 40.89±6.8, and 8.14±3.5 respectively. About 72.9% had more than secondary education Table 1.

Almost two thirds of the participants had secondary infertility Fig. 1.

Table 2 36.1% had previous pelvic surgeries, 11.4% had chronic pelvic pain and menstrual abnormality respectively.

Secondary infertility was more prevalent in women who has chronic pelvic pain, or those who has had previous pelvic surgery, previous IVF or previous abortion Tables 3 and 4.

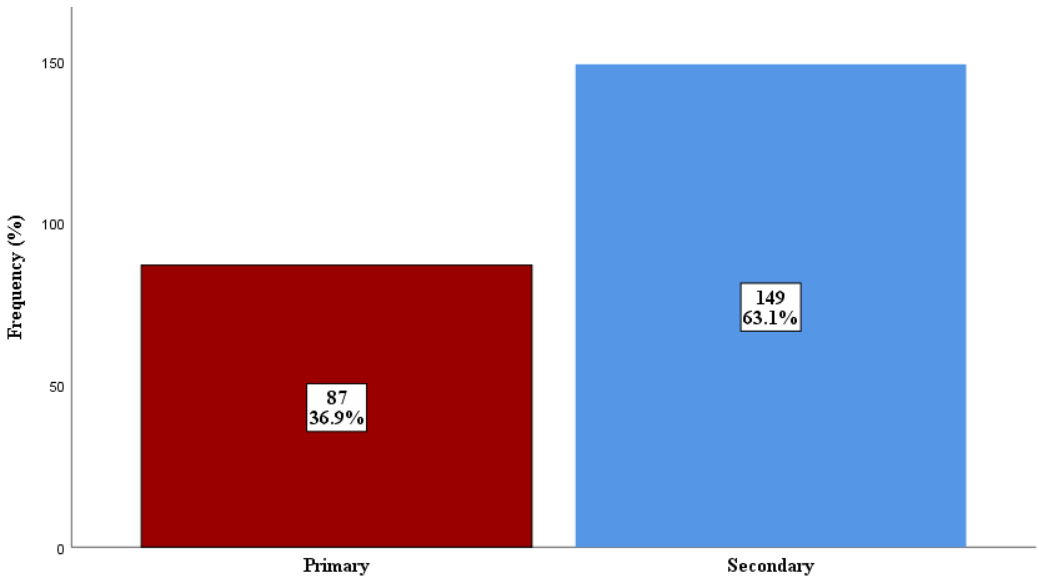

Fig. 1. Type of infertility

Table 1. Socio-demographic and clinical characteristics of the participants

Variable	Frequency (n=236)	Percentage
Age group (Years)		
≤30	13	5.5
31-40	104	44.1
41-50	100	42.4
>50	19	8.1
Mean± SD	40.89±6.8	
Religion		
Christianity	189	80.1
Islam	38	16.1
Others	9	3.8
Educational level		
≤Secondary	64	27.1
>secondary	172	72.9
Parity		
None	187	79.3
1	23	9.7
2	26	11.0
Number of living children		
0	212	89.8
1	23	9.7
2	1	0.4
Duration of infertility		
<10	166	70.3
≥10	79	29.7
Mean± SD	8.14±3.5	

Table 2. Relevant Previous Gynaecological history

Variable	Frequency (n=236)	Percentage
Chronic pelvic pain	27	11.4
Inadequate coital exposure	13	5.5
History of dyspareunia	1	0.4
Galactorrhea	7	3.0
Irregular menstruation	26	11.0
Previous contraceptive usage	21	8.9
Previous dilation and curettage	14	5.9
Previous history of abortion	20	8.5
Previous surgery	19	8.1
Previous myomectomy	66	28.0
Previous IVF	38	16.1
Hysteroscopy	23	9.7
Heavy menstrual bleeding	1	0.4
Vaginal discharge	1	0.4

Table 3. Association between type of infertility and socio-demographic characteristics

	Primary infertility (n=87)	Secondary infertility (n=149)	χ^2	p-value
Age group (Years)				
≤30	8(61.5)	5(38.5)	10.529	0.015*
31-40	45(43.3)	59(56.7)		
41-50	26(26.0)	74(74.0)		
>50	8(42.1)	11(57.9)		
Educational level				
≤Secondary	23(35.9)	41(64.1)	0.032	0.857
>secondary	64(37.2)	108(62.8)		
Parity				
None	73(39.0)	114(61.0)	1.892	0.388
1	7(30.4)	16(69.6)		
2	7(26.9)	19(73.1)		
Number of living children				
0				
1	85(40.1)	127(59.9)	9.375	0.009
2	2(8.7)	21(91.3)		
	0(0.00	1(100.0)		
Duration of infertility				
<10	59(35.5)	107(64.5)	0.420	0.517
≥10	28(40.0)	42(60.0)		

Table 4. Association between type of infertility and previous gynaecological history

	Primary infertility (n=87)	Secondary infertility (n=149)	χ^2	p-value
Chronic pelvic pain				
Yes	4(14.8)	23(85.2)	6.369	0.012*
No	83(39.7)	126(60.3)		
Inadequate coital exposure				
Yes	5(38.5)	8(61.5)	0.015	0.902
No	82(36.8)	141(63.2)		
History of dyspareunia				
Yes	1(100.0)	0(0.0)	1.720	0.190
No	86(36.6)	149(63.4)		
Galactorrhea				
Yes	3(42.9)	4(57.1)	0.111	0.739
No	84(36.7)	145(63.3)		
Irregular menstruation				
Yes	8(30.8)	18(69.2)	0.466	0.495
No	79(37.6)	131(62.4)		
Previous contraceptive usage				
Yes	5(23.8)	16(76.2)		
No	82(38.1)	133(61.9)	1.688	0.194
Previous dilation and curettage	4(28.6)	10(71.4)		
Yes	83(37.4)	139(62.6)	0.440	0.507
No				
Previous history of abortion				
Yes	6(30.0)	14(70.0)		
No	81(37.5)	135(62.5)	0.442	0.004*

	Primary infertility (n=87)	Secondary infertility (n=149)	χ^2	p-value
Previous surgery				
Yes	4(21.1)	15(78.9)	2.220	0.001*
No	83(38.2)	134(61.8)		
Previous myomectomy				
Yes	27(46.6)	31(53.4)	3.101	0.001*
No	60(33.7)	118(66.3)		
Previous IVF				
Yes	6(15.8)	32(84.2)	8.643	0.003*
No	81(40.9)	117(59.1)		
Hysteroscopy				
Yes	7(30.4)	16(69.6)	0.453	0.501
No	80(37.6)	133(62.4)		
Heavy menstrual bleeding				
Yes	0(0.0)	1(100.0)	0.586	0.444
No	87(37.0)	148(69.0)		
Vaginal discharge				
Yes	0(0.0)	1(100.0)	0.586	0.444
No	87(37.0)	148(63.0)		

4. DISCUSSION

This study analysed the epidemiological characteristics of the women seeking care at AFC centre at LUTH. Secondary infertility accounted for 63.1% in our participants. This is similar to the study of Esan and colleagues who also reported higher prevalence of secondary infertility in their study, but different from the study of Mohammed-Durosinlorun and colleagues who found that over half of the women in their cohort had secondary infertility [8,9]. The high prevalence of secondary infertility in our study may be attributed to the large number of women with previous pelvic surgeries, chronic pelvic pain and miscarriages.

The mean duration of infertility in our cohort is 8.14±3.5. This finding is higher from that reported by Adegbola et al in our facility a decade ago (4.3 ± 3.4 years). It is also higher than the finding of Taebi et al who found the mean duration of infertility to be 4.25 years in their study [4,10]. However, the finding in this research is similar to 7.5 ± 6.0, and 10 years reported by Mohammed-Durosinlorun, and Audu and co-researchers respectively. The variations in the mean infertility duration in years might be attributed to the differences in socio-cultural or religious factors in the regions of the country where the study was conducted. It may also be related to delays in getting pregnant by some women because of their academic pursuit. This is also evident in our study as over seventy percent of the women had more than secondary education. In Africa, couples having difficulty conceiving seem to seek help from unorthodox and or religious practices before presenting for specialist fertility care and this may also account for the delay in presentation [4,11,12].

The mean age of the infertile women in our cohort was 40.89±6.8 years. This is higher than 38 ± 5.2 years reported in our center previously, and 35 and 36.6 years reported in other studies [4,13,14]. This advanced maternal age may also be because many women preferred to differ their childbearing to a later date as shown in the proportion of women that attained greater than secondary education in our cohorts. Infertility is a complex disorder with the age of female partner having a significant impact on fecundability rate [15]. The age of female partner of couples seeking fertility care may affect the ability to conceive in several ways especially by impacting the quality and quantity of the oocytes [15]. It has been suggested in some studies that there is a steady decline in female fertility from 32 years. (previously 35 years) [15] Although this decline in female fertility with age is multifactorial, things that has remained consistent in literature are, abnormal meiosis and meiotic errors in oocytes, increase in the number of chromosomally anomalous oocytes that are ovulated at each cycle, (these abnormal oocytes will lead to increased rate of fertilization failure and increased risk of abortion), decrease in ovarian reserve with age, and impact of lifestyle changes

associated with ageing such as smoking, obesity and chronic medical conditions [16]. Undoubtedly age of the female partner has been fingered as the single prognostic factor in female fecundity both for natural conception and successful fertility treatments [17].

5. CONCLUSION

Our analysis suggests that Secondary infertility is the commonest cause of inability to conceive in our facility. It also revealed that most of our women present late for fertility care at an advanced maternal age.

6. STRENGTH AND LIMITATIONS

This has provided a robust data with relatively large sample size on various determinants and risk factors of female infertility; however we were constrained by studying only one centre in Lagos Nigeria which may not have covered the entire population.

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

We hereby declare that no generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc.) and text-to-image generators have been used during writing or editing of this manuscript.

ETHICAL APPROVAL

This study was approved by the research and ethics committee of LUTH (Ref. No: ADM/DCST/HREC/APP/5444).

CONSENT

As per international standards or university standards, Participants' written consent has been collected and preserved by the author(s).

ACKNOWLEDGMENTS

We are also grateful to all our fertility nurses for all the wonderful work they are doing. Sincere appreciation also to our Embryologist, medical records staff, receptionist and other staff of the assisted conception unit for the vital role they play the management of these patients.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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Peer-review history:
The peer review history for this paper can be accessed here:
https://www.sdiarticle5.com/review-history/123288