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Risk Factors and Hysteroscopic Findings in Women with Primary and Secondary Infertility in South-South Nigeria: A Comparative Study

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ABSTRACT

Background: *Infertility is a distressing condition that affects couples' mental and social well-being. Uterine pathologies such as intrauterine adhesions, cervical stenosis, submucous fibroid, polyps have been reported in women with infertility.* ***Objectives:*** *To compare risk factors of infertility and hysteroscopic findings in women with primary and secondary infertility in Calabar, Nigeria.* ***Methodology:*** *It was a cross-sectional study of 57 women of reproductive age, presenting with infertility in the gynecological clinic that consented to hysteroscopy between August 2019 and September 2020. A structured questionnaire was used to obtain socio-demographic data and hysteroscopy was done.* ***Results:*** *There was no significant difference in risk factors between primary and secondary infertility. Cervical stenosis (100%) (p=0.002) and intrauterine adhesions (89.5%) (p = 0.031) were higher in secondary infertility. History of adhesiolysis (100%) (p=0.011) was a significant risk factor for intrauterine adhesions in women with secondary infertility.* ***Conclusion:*** *Cervical stenosis and intrauterine adhesions contribute significantly to secondary infertility in our environment. The practice of intrauterine adhesiolysis which is most often a blind procedure in our environment is a risk factor for intrauterine adhesions.*

Keywords: Primary infertility, Secondary infertility, Risk factors, Hysteroscopy

INTRODUCTION

Infertility is defined as the failure to achieve a clinical pregnancy after 12 months or more of regular unprotected sexual intercourse [1,2]. It is a source of distress to couples and affects their psychosocial lives [3]. Infertility is classified into primary when there is the absence of previous clinical pregnancy and secondary which is infertility after pregnancy has occurred, but necessary a live birth [1]. Abnormal uterine intra-cavitary pathologies such as polyps, myomas, intrauterine adhesions, or uterine septum have been reported in a significant number of infertile women [4-6]. Endometrial cavity assessment is recommended as part of the evaluation of infertile couples. This can be achieved through different methods such as transvaginal sonography, hysterosalpingography, sonohysterography, and hysteroscopy; however, hysteroscopy is the gold standard [2,3,5].

Risk factors to uterine intra-cavitary pathologies include unsafe abortions, and adhesiolysis, myomectomy [5]. In the developing, countries where there are significant unmet contraceptive needs that are coupled with restrictive abortion laws, there is a high prevalence of unsafe abortion [7,8]. Moreover, a lot of women are postponing pregnancy in pursuit of career and education; this predisposes them to age-related uterine pathologies such as uterine myoma [9].

In recent times, the use of Assisted Reproductive Technologies (ART) to address infertility problems is increasing.

Intra-uterine pathologies such as submucous fibroid, intrauterine adhesions, structural abnormalities can affect natural conception as well as the success of ART [4,5]. Therefore, this study is aimed to compare risk factors of infertility and hysteroscopic findings in women with primary and secondary infertility in Calabar, South-southern Nigeria. The findings from this study will help to create awareness of how uterine related factors contribute to infertility in our environment.

MATERIAL AND METHODS

Design and Data Collections

This cross-sectional study included 57 women of reproductive age, presenting with a complaint of infertility in a gynecological clinic that consented to hysteroscopy from August 2019 to September 2020. Exclusion criteria were refusal to give consent, women that are not of reproductive age, pregnancy, women who had a hysterectomy and/or bilateral salpingectomy, women with cervical and/or uterine infection, women with lower genital malignancies, and contraindication to hysteroscopy. Ethical approval for the study protocol was obtained from the Ethics Committee of the University of Calabar Teaching Hospital, Calabar. Informed consent was obtained from all patients before the interviews. A structured questionnaire was used to obtain sociodemographic data.

All hysteroscopic examinations were done by the same operator and procedures were performed using a diagnostic hysteroscopy, consisting of a 4.1 mm sheath and 2.9 mm rod lens telescope (30 degrees). Illumination was provided using an LED light source via a fibreoptic lead, and all procedures were monitored using a video camera and monitor. Normal saline was used as distending media. Uterine distention was accomplished by a Hysteropump (Karl Storz), with the pressure pre-settled to 100 mmHg. Total intravenous anesthesia was used for anesthesia. All the hysteroscopic procedures were carried out during the proliferative phase of the menstrual cycle. With the patient lying in a lithotomy position, a bimanual pelvic examination was performed. The cervix was visualized through a vaginal speculum and the hysteroscope was introduced into the uterine cavity without dilating the cervix. The hysteroscope was guided through the endocervical canal into the uterine cavity under visual control. The tubal ostia were identified, and the endometrial surfaces were systematically inspected. The cervical canal was then viewed in its entire length during withdrawal of the hysteroscope. Findings were recorded using standard reports.

Statistical Analysis

Data was analyzed with SPSS statistics program (IBM Corp. version 26). Fisher's exact test was used for statistical comparison. The level of significance was taken at $p<0.05$.

RESULTS

Socio-demographic and risk factors for infertility are illustrated in Table 1. There was no significant difference in age, Body Mass Index (BMI), social class, menstrual abnormality, history of adhesiolysis, history of myomectomy, and history of pelvic inflammatory disease between participants with primary and secondary infertility.

Hysteroscopic findings of participants are shown in Table 2. Intrauterine adhesions (66.7%) and cervical stenosis (42.1%) were the most common findings. The normal endometrial cavity had a prevalence of 10.5%. The uterine anomaly was the least: septate uterus (3.5%) and fibrosis tubal ostia (1.8%).

Table 3 shows the hysteroscopic findings and types of infertility. Cervical stenosis (100%) ($p=0.002$) and intrauterine adhesions (89.5%) ($p=0.031$) were significantly higher in secondary infertility. Other findings: endometrial polyp, submucous fibroid, and healthy endometrium were not significantly different between primary and secondary infertility.

Unsafe abortion, history of adhesiolysis, history myomectomy, and history of cesarean section were not significant risk factors for cervical stenosis in participants with secondary infertility as shown in Table 4.

Table 5 shows risk factors for intrauterine adhesions in secondary infertility. History of adhesiolysis (100%) ($p=0.011$) was a significant risk factor for intrauterine adhesions.

Table 1 Sociodemographic and risk factors for infertility of participants

Variables	Total	Primary infertility (%)		Secondary infertility (%)		p-value
Age (years)						
<40	42	11	26.2	31	73.8	Fisher's test
≥ 40	15	0	0	15	100	p=0.051
Body Mass Index (BMI)						
<30	35	8	22.9	27	77.1	Fisher's test
≥ 30	22	3	13.6	19	86.4	p=0.502
Social Class						
Upper	50	10	20	40	80	Fisher's test
Middle/Lower	7	1	14.3	6	85.7	p>0.999
Menstrual Abnormality						
Heavy menstrual bleeding	11	2	18.2	9	81.8	Fisher's test
Irregular menstrual cycle	29	7	24.1	22	75.9	p>0.999
History of Adhesiolysis						
Yes	15	2	13.3	13	86.7	Fisher's test
No	42	9	21.4	33	78.6	p=0.709
History of Myomectomy						
Yes	21	2	9.5	19	90.5	Fisher's test
No	36	9	25	27	75	p=0.185
History of Pelvic Inflammatory Disease						
Yes	10	1	10	9	90	Fisher's test
No	47	10	21.3	37	78.7	p=0.668

Table 2 Hysteroscopic findings of participants

Findings	Number	%
Normal findings	6	10.5
Intrauterine Adhesions	38	66.7
Cervical Stenosis	24	42.1
Endometrial Polyp	12	21.1
Submucous Fibroid	11	19.3
Septate Uterus	2	3.5
Fibrosed tubal ostia	1	1.8

Table 3 Hysteroscopic findings and types of infertility

Variables	Total	Primary infertility (%)		Secondary infertility (%)		p-value
Cervical Stenosis						
Yes	24	0	0	24	100	Fisher's test
No	33	11	33.3	22	66.7	p=0.002*
Intrauterine Adhesions						
Yes	38	4	10.5	34	89.5	Fisher's test
No	19	7	36.8	12	63.2	p=0.031*

Endometrial Polyp						
Yes	12	4	33.3	8	66.7	Fisher's test
No	45	7	15.6	38	84.4	p=0.219
Submucous Fibroid						
Yes	11	1	9.1	10	90.9	Fisher's test
No	46	10	21.7	36	78.3	p=0.671

Table 4 Risk factors for cervical stenosis in secondary infertility

Variables	Total	Cervical Stenosis present (%)		Cervical Stenosis absent (%)		p-value
Unsafe abortion						
Yes	32	19	59.4	13	40.6	Fisher's test
No	14	5	35.7	9	64.3	p=0.202
History of Adhesiolysis						
Yes	13	7	53.9	6	46.1	Fisher's test
No	33	17	51.5	16	48.5	p>0.999
History of Myomectomy						
Yes	19	11	57.9	8	42.1	Fisher's test
No	27	13	48.2	14	51.8	p=0.562
History of Caesarean Section						
Yes	5	1	20	4	80	Fisher's test
No	41	23	56.1	18	43.9	p=0.178

Table 5 Risk factors for intrauterine adhesions in secondary infertility

Variables	Total	Intrauterine Adhesions present (%)		Intrauterine Adhesions absent (%)		p-value
Unsafe abortion						
Yes	32	26	81.3	6	18.7	Fisher's test
No	14	8	57.1	6	42.9	p=0.143
History of Adhesiolysis						
Yes	13	13	100	0	0	Fisher's test
No	33	21	63.6	12	36.4	p=0.011*
History of Myomectomy						
Yes	19	16	84.2	3	15.8	Fisher's test
No	27	18	66.7	9	33.3	p=0.307
History of Caesarean Section						
Yes	5	2	40	3	60	Fisher's test
No	41	32	78.1	9	21.9	p=0.103

DISCUSSION

Infertility is a distressing condition for couples, especially in our environment where a high premium is placed on childbirth [3]. Tubal and uterine related infertility has a high prevalence in our environment [10]. This study compared the hysteroscopic findings of women with primary and secondary infertility. There was no significant difference in age, history of adhesiolysis, history of pelvic inflammatory disease, and other risk factors between primary and secondary infertility in the present study. Ajayi et al, reported 35 years of age and above as a significant risk factor for

intrauterine adhesions among women with infertility in south-western Nigeria [11]. Martin et al in a study of hysteroscopic findings of infertile women in Paris, France found that the risk of intrauterine pathologies increases with age [12]. These findings suggest that there may not be a difference in risk factors between the types of infertility although the risk of uterine intra-cavitary etiologies increases as a woman advances in age.

Intrauterine adhesions and cervical stenosis were the commonest hysteroscopic findings in the present study. Previous similar studies reported normal endometrial findings as to the major finding among participants [6,12-14]. However, Ajayi et al, in western Nigeria, found abnormal hysteroscopic findings in 61.7% of infertile women [11]. The disparity could be due to the difference in sample size. It could also suggest that intra-cavitary pathologies such as intrauterine adhesions and cervical stenosis play a major role in the burden of infertility in our environment. This calls for the need to increase awareness and practice of endoscopic gynecological procedures in low resources countries and conduct a larger-scale study to establish contributions of intrauterine pathologies to the etiology of infertility in our environment.

This study found that cervical stenosis and intrauterine adhesions were significantly higher in secondary infertility than primary infertility. A previous study reported similar findings [6,14]. A study of hysteroscopic findings of 100 women with infertility in India reported no difference in cervical stenosis and intrauterine adhesions between primary and secondary infertility; however, hypertrophic, and atrophic endometrium was higher in primary infertility [13]. These findings suggest that pregnancy-related factors such as complications of unsafe abortions, prolonged obstructed labor, puerperal sepsis which is prevalent in low resource countries could explain the higher occurrence of uterine adhesions in secondary infertility. Studies have reported secondary infertility as a sequel to unsafe abortions and poorly managed labor [15,16].

The history of adhesiolysis was a significant risk factor for uterine adhesions in women with secondary infertility in this study. A study in south-eastern Nigeria reported a history of cesarean section and myomectomy as the commonest etiology of intrauterine adhesion among women with infertility [17]. It shows that the etiology of intrauterine varies in different environments. The majority of adhesiolysis in low resource settings are done as a blind procedure, using a uterine or dilator [18]. This can cause trauma to the normal endometrium, which heals with fibrosis, leading to more adhesions. There is a need to educate patients, doctors, and other caregivers on the danger of blind intrauterine procedures and the benefits of hysteroscopic guided approaches.

CONCLUSION

In conclusion, intrauterine adhesions and cervical stenosis were common among infertile women, especially women with secondary infertility. History of adhesiolysis by blind approach is a significant risk factor for intrauterine adhesions. Hysteroscopic adhesiolysis is recommended to reduce the risk of intrauterine adhesions.

DECLARATIONS

Conflicts of Interest

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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