ORIGINAL ARTICLE

Hysteroscopic Characterization and Classification of Intrauterine Adhesions among Infertile Nigerian Women

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ABSTRACT

Background: There is paucity of data on the application of hysteroscopy in the management of intrauterine adhesions in Nigeria.
Objective: To describe the hysteroscopic characterization and classification of intrauterine adhesions seen among infertile Nigerian women managed at the Fertility and Endoscopy Units of Nnamdi Azikiwe University Teaching Hospital Nnewi and Holy Rosary Specialist Hospital Onitsha, Nigeria.
Methodology: This is a prospective study. A proforma was used to document intra uterine adhesion findings at hysteroscopy and the collected data were analyzed with STATA software, version 12.0 SE. The ASRM Grading system was used to define the severity of the lesions.
Results: Seventy six (47.8%) out of 159 infertile women managed during the period had intrauterine adhesions. The age range of the women was 26-43 years (mean 34.8±5.1) and the mean parity was 0.75± 1.03. Fifty six (73.7%) of the women had secondary infertility and abnormal menstruation was found in 47(61.8%).
Adhesions were mainly multiple (88.2%; n=67) and of a combined dense and filmy types (39.5%; n= 30). Obliterative lesions were found in 44(57.9%) while in 10(13.2%) women, it was obstructive. The uterine cavity was partially involved in 48(63.2%) of the women and completely in 19(25.0%). The tubal ostia were involved in 47(61.8%) of the cases. The left ostium was not visualized in 18(23.7%) cases and the right ostium in 22(29.0%) cases. The cervical os was involved in adhesion in 26(34.3%) cases and was completely occluded in 16(21.1%) cases. Severe adhesion was seen in 19(25.0%) of the women.
Conclusion: The intrauterine adhesions among the studied women were mainly mild and moderate in severity, multiple, obliterative and of a combined dense and filmy nature.

Keywords: *Adhesiolysis, Hypomenorrhoea, Amenorrhoea, Infertility, Endometrial lesions*

INTRODUCTION

Intrauterine adhesions are caused by traumatic or infectious injury to the basalis layer of the endometrium and are significant cause of reproductive failure.

The exact reason for the failure of some women to achieve endometrial regeneration following trauma is not too clear but it appears that injuries involving the basal layer of the endometrium usually heals with fibrosis and scarring especially during the postpartum or post abortion period marked by hypoestrogenism. The reproductive consequences of intrauterine adhesions (IUAs) include reduction in menstrual flow, recurrent miscarriages, infertility and abnormal placentation. Ectopic pregnancy may result from involvement of the tubal ostia.

The aetiological events in IUA include dilatation and curettage of a recently pregnant uterus, caesarean section, myomectomy and hysteroscopic procedures especially myomectomy and extensive adhesiolysis.

The prevalence of IUA varies widely and may be due to the differences in the prevalence of the risk factors and the frequency of the use of hysteroscopy in the evaluation and treatment of infertile women. In Nigeria, prevalence rates of 1.8% and 2.7% of all gynaecological patients were reported by Etefie *et al*. and Gaya *et al*. in Abuja and Kano, respectively.[1,2] But among women being worked up for In-Vitro Fertilization(IVF), Okohue *et al.* and Ajayi *et al.* found high rates of 64.2% and 49.1%, respectively.[3,4] This may be attributable to the fact that hysteroscopy was used in the diagnosis among the IVF patients who are also more at risk than the general population.

Typically, women with IUA present with a progressive reduction of menstrual flow leading to hypomenorrhoea, amenorrhoea and infertility; associated occasionally with cyclical abdominal pain, dysmenorrhoea and chronic pelvic pain.[5,6,7] There may be associated recurrent first trimester miscarriage. Sometimes there are no clinical features, but adhesion bands are found on routine hysteroscopy for evaluation of infertility.

Hysterosalpingogram(HSG) and pelvic ultrasonography (especially 3-D sonography) when combined with saline infusion sonography or a contrast in Hysterocontrastsynography (Hycosy) have been found very useful in the diagnosis of IUA.[8,9] Ultrasound is particularly useful in cases of complete obstruction at the level of the internal cervical os where HSG cannot be done.

But the gold standard for the diagnosis of intrauterine adhesions is hysteroscopy. It enables the mapping and classification of the adhesion bands in terms of: the nature of the bands, the extent of cavity involvement and the distribution of the bands. It also shows if the tubal ostia are involved. Most importantly, hysteroscopy enables the surgical excision/resection of the bands under vision.

Morphologic characterization with classification of intrauterine adhesion is invaluable in prognostication following resection. Severe IUAs are associated with the worst prognosis and highest recurrence rate. In addition, the clinical presentation depends on the extent, the distribution and configuration of the adhesion bands. Either hysteroscopy or HSG or can be used for the classification and grading. There are many classification systems but classification by the American Society for Reproductive Medicine (ASRM) classification has found a wide application. [10]

This classification considers four parameters which are scored. These include the menstrual pattern, the nature of the adhesions and the extent of the cavity involved. It classifies intrauterine adhesions into mild, moderate and severe. [10]

However, adhesions can also be described either as obliterative, obstructive or both under hysteroscopic view. They could be complete, partial or focal lesions involving the cavity, the internal cervical os and the tubal ostia either singly or in combination. They could also be dense or filmy, multiple or single and fibrous or fibro muscular. Dense and angular (periostial) adhesions are the most difficult to resect.

In terms of symptomatology, focal lesions affecting small areas of the uterine cavity are usually asymptomatic and discovered during routine evaluation of infertile couples while in complete obliteration of the cavity, the patient presents with amenorrhea usually on a background of infertility. But occasionally there might be small pockets of endometrial tissue that may cause cyclical pelvic pain. In partial obliterative lesions, the patient presents with reduced menstrual flow, cyclical abdominal pain, dysmenorrhoea or chronic pelvic pain.

Obstructive lesions usually affect the lower part of the uterus and internal os and could be partial or complete. Complete obstructive lesions present with amenorrhea and cyclical lower abdominal pain. There may or may not be haematometra. In partial obstructive lesions, there is usually progressive reduction in menstrual flow associated with dysmenorrhoea and chronic pelvic pain.

Hysteroscopic adhesiolysis is the gold standard approach in the surgical management of IUAs and has been associated with good outcome.[11,12,13] Hysteroscopic resection is usually followed by the insertion of either an intrauterine catheter balloon or intrauterine device to keep the walls of the uterus apart during the healing phase. A combination of estrogen and progestogens is given to facilitate endometrial regeneration and re-growth.

In Nigeria, there is paucity of data on the hysteroscopic management of IUAs. So far, no work has reported on the hysteroscopic characterization and classification of intrauterine adhesions, to the authors' best knowledge. This study therefore is aimed at providing information on the hysteroscopic characterization and classification of IUAs among a population of Nigerian infertile women.

Our main objective was to document the hysteroscopic characterization and classification of intrauterine adhesions among infertile women managed in our unit over an 18- month period.

The specific objectives were to:
study the socio-demographic characteristics of the women with intrauterine adhesions;
define the types, distribution and configuration of IUAs seen among the infertile women; study the ostia and cervical os involvement of IUAs found among the women; define the severity of IUAs found among the women using the ASRM criteria.

METHODOLOGY

Study Setting

The study was done in two centres: The Fertility and Gynaecological Endoscopy Units of Nnamdi Azikiwe University Teaching Hospital (NAUTH) Nnewi, Anambra State Nigeria and Holy Rosary Specialist Hospital Onitsha, Anambra State Nigeria.

Study Design

A cross sectional descriptive study of IUAs found among infertile women who presented to the units over an 18 months period (1st November, 2015 – 30th April, 2017) .

Study Population

All women who were managed for intrauterine adhesions in the units over the study period were recruited.
The patients were well counseled on the purpose of the study and they all gave written consent. Those who withheld consent were excluded from the study.

Ethical Clearance

Ethical clearance was obtained from the NAUTH Institutional Ethics Committee. The ethical principles of non-malfeasance, beneficence, confidentiality and respect of

persons were applied throughout the duration of the study.

Procedure

On arrival at the clinic, a proforma was used to collect biosocial and clinical data from all the women who presented with infertility. The information obtained includes the biosocial data, the presenting complaint, menstrual pattern, reproductive performance and the aetiological/initiating clinical events. The women included those who have done HSG already, those with clinical history suggestive of IUAs and those that presented for management on account of infertility.

After initial clinical evaluation and work up, these women are then booked for diagnostic/operative hysteroscopy. Misoprostol (50ug) was inserted into the posterior fornix a night before the procedure in the nulliparous women to aid cervical os dilatation.

Hysteroscopy was done with the Stryker® Camera, Monitor and Light Source(Stryker Endoscopy, San Jose, CA 95136 USA) while the Hysteroscopes used were of TeKno Medicals(Germany). The procedure was done in the immediate post menstrual phase, but at any convenient time for the amenorrhoeic women, under general anaesthesia because laparoscopy and dye test for tuboperitoneal evaluation was also done at the same setting.

The procedure starts with the administration of anaesthesia, patient positioning in semi-lithotomy position, bladder drainage, and bimanual pelvic examination to define the size and orientation of the uterus. This is followed by exposition of the cervix with Sim's speculum, grasping the anterior lip with vulsellum, estimation of the uterine depth and cervical os dilatation.

Routinely, we started with 5.5mm diagnostic sheath for all patients, but in those with IUA already diagnosed, we started with size 6.5 mm operative hysteroscope with normal saline as the distending media. In all cases, we attempted adhesiolysis with the hysteroscopic scissor initially. In cases where this was not possible, a further cervical dilatation was done to accommodate the 9mm monopolar resectoscope, and the tough adhesion bands were then resected with the 0-degree loop or knife using a cutting current set at 60watts with glycine as the distension media.

The distension media was delivered via a manual pressure bag pump with a gauge suspended on a drip stand. Distension pressure was maintained at 80- 120 mmHg. As much as possible, all the adhesion bands were incised using the appearance of the fleshy muscular myometrium, presence of bleeding and the internal os as guides to the extent of resection. All the severe cases were done under laparoscopic guidance.

The proforma was completed with the findings from hysteroscopy which included the extent of cavity involvement, the nature and distribution of the adhesions as well as the ostia involvement. The severity of the IUAs was determined using the American Society for Reproductive Medicine (ASRM) criteria.[10]

Postoperatively, a paediatric Foley's catheter size 8 was introduced into the uterine cavity and distended with 3-5 ml of sterile water depending on the size of the cavity. Patients were also commenced on estradiol tablets for 21 days and medroxy-progesterone for the last 10 days. They were also given antibiotics and discharged the same day. The catheter was usually removed after 10 days.

Data Analysis

Data was analyzed with Stata version 12.SE (Stata Corporation TX, USA). The mean, median and modes were calculated for the continuous variables while percentages were calculated for the composite variables. The results were presented in tables

RESULT

Socio-demographic Profile of the Women

Seventy six (47.8%) out of 159 infertile women treated during the period had intrauterine

adhesions. As shown in table 1, the age range of the women was 26-43years (mean 34.8±5.1). Parity ranged from 0 to 3 with a mean parity of 0.75±1.03. Most of the women had tertiary education (80.3%) and were mainly public servants (32.9%). Fifty of the women (65.2%) belong to the upper social class and 63.2% (n=48) of their husbands were traders.

Clinical Characteristics of the Women

Fifty six (73.7%) of the women had secondary infertility, which had lasted for more than 2 years in 45(59.2%) of them. Abnormal menstruation was found in 47(61.8%) of the women while 23(30.3%) and 33(43.4%) of the women had cyclical abdominal pain and secondary dysmenorrhoea, respectively. There was a history of previous attempts at correction in 12(15.8%) of the women (Table 2).

Table 1. Socio-demographic profile of the women with intrauterine adhesions

Socio-demographic Characteristics	Frequency	Percent
Age Range		
25-29	21	27.6
30-34	7	9.2
35-39	39	51.3
40 and above	9	11.8
Age Category		
Less than 35	25	32.9
35 & above	51	67.1
Highest Educational Status		
Primary	2	2.6
Secondary	13	17.1
Tertiary	61	80.3
Parity Range		
0-1	63	82.9
2-4	13	17.1
Occupation		
public servant	25	32.9
Health worker	21	27.3
Housewife	8	10.5
Trading	11	14.5
Student	11	14.5
Social class		
2 and below	50	65.8
>2	26	34.2
Husbands Occupation		
Trader	48	63.2
Public servant	11	14.5
Artisan	8	10.5
Health worker	9	11.8
Religion		
Catholic	29	38.2
Anglican	42	55.3
Pentecostal	5	6.6

Table 2. Clinical Characteristics of the women with intrauterine adhesions

Characteristic	Frequency	Percent
Type of Infertiity		
Primary	20	26.3
Secondary	56	73.7
Duration of Infertility		
2 years and below	31	40.8
More than 2 years	45	59.2
Menstrual Pattern		
Normal	29	38.2
Hypomenorrhoea	25	32.9
Amenorrhea	22	28.9
History of Cyclical Abdominal Pain		
Yes	23	30.3
No	53	69.8
Presence of Secondary Dysmenorrhoea		
Yes	33	43.4
No	43	56.6
Pelvic Surgery		
Yes	50	65.8
No	26	34.2
Previous Attempt at Correction		
Yes	12	15.8
No	64	84.2

Hysteroscopic Characterization of the Intrauterine Adhesions

As shown in table 3, mild to moderate adhesions was found in 57(55.0%) of the

women and comprised mainly of multiple adhesions (88.2%; n=67) and of a combined dense and filmy types (39.5%; n= 30). Obliterative lesions were found in 44(57.9%) while in 10(13.2%) women, it was obstructive. The uterine cavity was partially involved in 48(63.2%) of the women and completely in 19(25.0%). The tubal ostia was involved in 47(61.8%) of the cases.

Table 3. Hysteroscopic characterization of intrauterine adhesions among the women

Adhesion characteristics	Frequency	%
ASRM Classification		
Mild	33	43.4
Moderate	24	31.6
Severe	19	25.0
Type of Adhesion Bands		
Dense	24	31.6
Dense & filmy	30	39.5
Filmy	22	29.0
Number of Adhesion Bands		
Single	9	11.8
Multiple	67	88.2
Configuration of Adhesions		
Obliterative	44	57.9
Obstructive	10	13.2
Combination	23	30.3
Distribution of the Adhesion Bands		
Cavity& Periostial	25	32.9
Cavity, internal os & periostial	22	28.9
Cavity alone	29	38.2
Extent of Cavity Involvement		
Complete	19	25.0
Partial	48	63.2
Focal	9	11.8
Cervical Os Occlusion		
Nil	50	65.8
Complete	16	21.1
Partial	10	13.2
Left Ostia		
Normal	36	47.37
Not visualized	18	23.68
Involved	22	28.95
Right Ostia		
Normal	35	46.05
Not visualized	22	28.95
Involved	19	25.00

Table 4. Laparoscopy findings among women with intrauterine adhesions

Findings	Frequency	%
Abnormal Laparoscopy Findings		
No	15	19.7
Yes	61	80.3
Presence of Tubal Pathology		
Yes	57	75.0
No	19	25.0
Presence of Tubal Occlusion		
No	35	46.1
Yes	41	54.0
Presence of Peritoneal Adhesions		
Yes	42	55.3
No	34	44.7

The left ostium was not visualized in 18(23.7%) cases and the right ostium in 22(29.0%) cases. The cervical os was involved in adhesion in 26(34.3%) of cases and was completely occluded in 16(21.1%) of cases.

DISCUSSION

Intrauterine adhesions cause significant reproductive failure. The prevalence rate of 47.8% of IUAs from this study is high but comparable to other reports from Nigeria when hysteroscopy was used for the diagnosis.[3,4] But it is very much higher than 1.8% and 2.7% reported by Etefie *et al.* and Gaya *et al.,* respectively using clinical basis for diagnosis.[1,2] This higher diagnostic yield of IUAs using hysteroscopy when compared with clinical methods may indicate the need to introduce hysteroscopy as a routine evaluation tool in the management of infertile women.

In terms of grading using ASRM classification, most of the adhesions were either mild or moderate in severity. Severe adhesions were encountered in 25% of cases.

This means that a reasonably good outcome is expected from most of the case as reproductive outcome is directly related to the severity of the lesions.

Management of severe intrauterine adhesions is very challenging and many approaches have been developed to improve outcome. Zhang *et al.* in China described the ploughing method in which the scar tissue covering the inner uterine walls are ploughed through to release the contraction imposed by the scar and provide a fresh and rich blood supply to the endometrium to grow and cover the area of the surgery.[14] This has been shown to be successful in the management of severe IUAs.

Again, recurrence is seen more in severe cases and in the adhesions located close to the uterine cornua.[15,16,17] To reduce the risk of recurrence, estrogen therapy and use of intrauterine catheter balloon have been effective.[18] These were used in all our cases. Other strategies that have been shown to reduce the rate of recurrence and improve reproductive outcome include amnion graft applied over the Foley's catheter balloon and the use of oxidized, regenerated cellulose adhesion barrier alongside an intrauterine contraceptive device.[19,20,21] We did not use these modalities.

Most of the adhesion bands were of a combination of dense and filmy nature. Dense adhesion bands are more difficult to incise than the filmy ones which could easily be removed even with the hysteroscopy sheath. In most of the women, the uterine cavity was only partially involved. This is in line with the fact that in most women, adhesions were either mild or moderate in severity.

The high rate of tubal ostia involvement as observed in this work increases the risk of tubal occlusion and ectopic pregnancy among these women. This may account for the high rate of tubal occlusion found on laparoscopy and dye test among them. Proximal tubal occlusions caused by IUAs are amenable to surgical treatment through resection of the adhesions and in other cases, hysteroscopic tubal probing and cannulation.

Most of the lesions were obliterative in configuration followed by a combination of obliterative and obstructive lesions. The significant rate of obstructive lesions may account for the cyclical abdominal pain and secondary dysmenorrhoea found in significant number of the women. Obstructive lesions are associated with reduced menstrual flow, cyclical abdominal pain, dysmenorrhoea and chronic pelvic pain. Partial obliterative lesions can also give rise to the above symptoms if there are pockets of functioning endometrium still present in the uterus. Complete obliterative lesions will give rise to amenorrhea in the absence of abdominal and pelvic symptoms.

Cervical os involvement was found in 34.3% of cases. Involvement of the os gives rise to obstructive symptoms. In complete obstruction of the os, ultrasonography becomes superior to HSG in making the diagnosis of IUA. Obstruction also creates additional challenge in gaining entrance into the uterine cavity, thus increasing the risk of cervical laceration. A significant number (55.3%) of the women had peritoneal adhesions.

Limitations

This was a hospital based study conducted among a population that is at high risk of intrauterine adhesions. The findings, therefore may not be generalizable to the general public

CONCLUSION

There was a high prevalence of intrauterine adhesions among the studied women which were mainly mild and moderate in severity; multiple, obliterative and of a combined dense and filmy nature. The rate of ostial involvement was also high. There is need to build capacity for hysteroscopy to aid the management of infertile women in Nigeria.

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