

# Hysterosalpingographic patterns and relevance in the management of infertility in a Nigerian tertiary health Institution



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## ABSTRACT

**Background:** Infertility is a major clinico-social problem not only in Nigeria; but the whole of the sub-saharan Africa and other parts of the world. In Nigeria it accounts for over 50% of attendance in Gynecological clinics. Hysterosalpingography (HSG) is still a very valuable imaging modality in the work-up of women with infertility; especially in some communities in Nigeria where modern non-invasive diagnostic modalities are not readily available in most of the health institutions. **Aims and Objectives:** The study aims at evaluating the HSG findings among women with infertility to further highlight the relevance of this imaging modality in the management of infertility. **Materials and Methods:** A retrospective review of 205 consecutive Hysterosalpingograms from the University of Calabar Teaching Hospital between October 2013 and September 2015 was done. The Radiological findings and demographic data of the patients were documented and analyzed. **Results:** Pathologies were reported on 176 (85.8%) Hysterosalpingograms while 29 (14.14%) were normal. The age range of the patients was between 21 and 55 years and the commonest age group was 31 – 35 years. The commonest pathological findings were in the uterus; namely uterine fibroids, 86 (41.95%), uterine synechia, 19 (9.26%), Asherman syndrome and congenital abnormalities, 5 each (2.43%). The next commonest pathologies were those associated with tubal occlusions. **Conclusion:** Hysterosalpingography still plays a major investigative role in the evaluation and management of women with infertility. The commonest abnormalities seen in this study were in the uterus.

**Key words:** Infertility, Hysterosalpingogram, Fibroids, Tubal Occlusion

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## INTRODUCTION

The World Health Organization (WHO) defines infertility as “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.”<sup>1</sup>

In most parts of the world, infertile couples, especially the women suffer physical and mental abuses, neglect, economic deprivation and social ostracism.<sup>2,3</sup> Detecting the cause of infertility and its successful management to achieve the desired result (pregnancy), brings much joy to couples and families and has been shown to strengthen marriages.

Despite the availability of an array of diagnostic modalities such as Ultrasound (US), Magnetic Resonance Imaging (MRI), Hysteroscopy and Laparoscopy, Hysterosalpingography (HSG) is still a very valuable tool in the work-up of women with infertility. 80 – 93% of these women show one form of abnormality or another on HSG.<sup>4-6</sup> It is still a first line investigation in the evaluation of tubal patency.<sup>9,10</sup> Other diagnostic modalities are either not readily available in most of our local centres, or they may be less insensitive, with reduced resolution and definition especially in detecting tubal abnormalities which many studies have shown to contribute between 30 – 40% to the problem of infertility in women.<sup>7-10</sup> HSG's sensitivity and specificity

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are estimated at 65 – 81% and 47 – 50% respectively for tubal pathologies.<sup>11,12</sup>

Tubal factors commonly detectable at HSG include complete or partial occlusions, chronic salpingitis, Hydrosalpinx and peritubular adhesions.<sup>10-12</sup> Uterine abnormalities include congenital abnormalities, polyps, fibroids, adhesions and adenomyosis.<sup>8,10</sup> They are said to account for about 10% of infertility in women and 50% of women with recurrent early pregnancy loss.<sup>13</sup>

While some clinicians would prefer non and less invasive diagnostic procedures to HSG.<sup>14</sup> Some patients decline to carry out the investigation either due to increasing high cost or fear of pain.<sup>15,16</sup>

This study therefore aims at highlighting HSG findings in cases of infertility in our environment in order to sensitize the clinicians to the benefits and relevance of the investigation in the planning and management of infertility.

## MATERIALS AND METHODS

Two Hundred and Five (205) consecutive Hysterosalpingograms and their attached request forms from the Radiology Department of the University of Calabar Teaching Hospital between October 2013 and September 2015 were retrieved and reviewed.

Patient’s bio-data, indications for HSG and the radiological findings were documented and analyzed using Microsoft Spreadsheet and subjected to descriptive statistical analysis using SPSS version 18.

## RESULTS

Age range was between 21 and 55 years with a mean of 36 years (Table 1). The commonest age group was 31 – 35 years with a total number of 66 (32.19%). Out of the 205 cases reviewed; 29 (14.14%) had normal findings while 176 (85.8%) showed abnormalities.

Uterine pathologies were the commonest abnormalities and accounted for 115 (56.10%) (Table 2). Of these, uterine fibroids were the most documented uterine abnormalities; accounting for 86 (41.95%) of all the cases. Majority, 62 (30.24%) were intramural or sub serous, presenting as uterine cavity enlargement, distorted or irregular outline and displacement of the cavity. The remaining 24 (11.71%) were sub mucous, presenting mainly as rounded or irregularly shaped marginal, central or fundal filling defects. Uterine Synaechiae was documented in 19 (9.26%) cases while

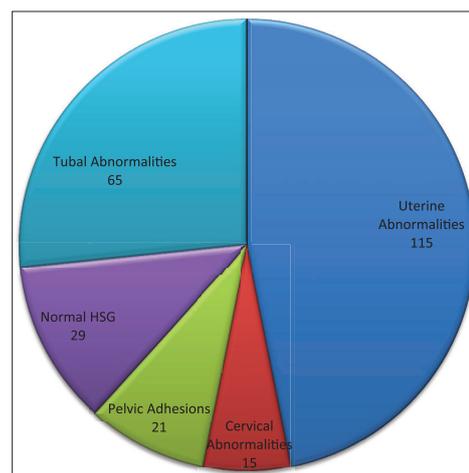
**Table 1: Age range of subjects**

Age range (years)	Number	Percentage
21–25	12	5.88
26–30	28	13.65
31–35	66	32.19
36–40	45	21.95
41–45	42	20.48
46–50	11	5.36
50–55	1	0.48
n=205 (100%)		

**Table 2: HSG findings**

Findings	Number	Percentage
<b>Cervical abnormalities</b>		
Cervical stenosis	4	1.95
Cervical polyp	3	1.46
Patulous cervix	8	3.90
	15	7.32
<b>Uterine abnormalities</b>		
Congenital abnormalities	5	2.43
Uterine synaechiae	19	9.26
Asherman’s syndrome	5	2.43
<b>Uterine fibroid</b>		
i: Intramural/subserous	62	30.24
ii: Submucous	24	11.71
	115	56.10
<b>Tubal abnormalities</b>		
Tubal occlusion with hydrosalpinx	30	14.63
Tubal occlusion without hydrosalpinx	21	10.24
Hydrosalpinx without tubal occlusion	10	4.87
Chronic salpingitis without hydrosalpinx	4	1.95
	65	31.70
<b>Pelvic adhesion</b>	21	10.24
<b>Normal HSG</b>	29	14.14
n=245		

40 (19.5%) HSGs had multiple pathologies



Pie chart showing distribution of hsg findings

congenital abnormalities of the uterus and Asherman’s disease were the least uterine abnormalities.

The next most common group of pathologies were seen in the Fallopain tubes with 65 (31.7%) of the reviewed

hysterosalpingograms. They were mostly tubal occlusions and hydrosalpinx.

Pelvic adhesions accounted for 21 (10.24%) of the reviewed radiographs. Multiplicity of lesions accounted for the 245 pathologies seen in the 205 cases reviewed; with 40 (19.5%) hysterosalpingograms showing multiple abnormalities.

## DISCUSSION

Infertility poses a global health and social challenge.<sup>1-3</sup> In Nigeria, 50% of women attending Gynecological clinics complain of infertility.<sup>2,8</sup> As seen in this study, 176 (85.8%) out of the 205 cases reviewed showed abnormalities. This is almost similar to a study in Ilorin, North Central Nigeria, where 93% of the cases had abnormalities.<sup>8</sup> Many other studies within Nigeria also indicate a high percentage of abnormalities among infertile women referred for HSG.<sup>5,6</sup> Most cases of infertility are associated with pathologies causing partial or complete distortion of the uterine cavities

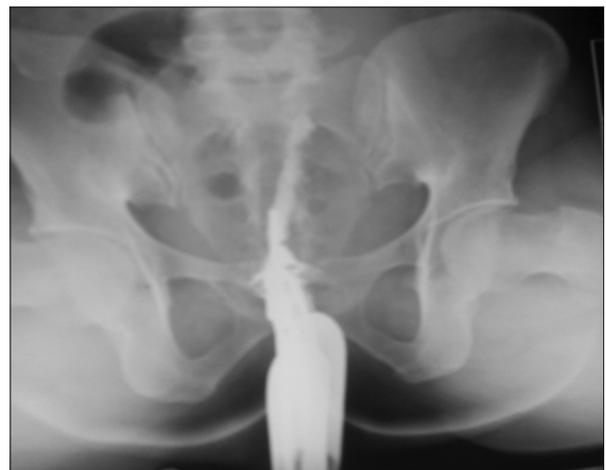
and the occlusion of the fallopian tubes. HSG clearly outlines this reproductive pathway and thus a very valuable tool in the investigation of infertility.

Our study reveals that women in the reproductive age groups (26-30, 31-35, 36-39) had the highest number of referrals (Table 1). This is in keeping with the high reproductive demand in this age groups.<sup>10</sup> The minimum age seen was 23 years compared to studies in Northern Nigeria with a minimum age of 17 years. This has to do with the socio-cultural background in the North where early marriages are common.<sup>13,17</sup>

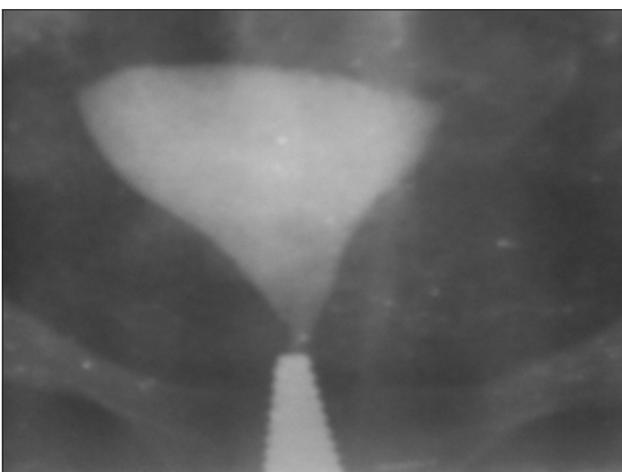
The commonest abnormalities in our study were of uterine origin (Table 2). Of these, uterine fibroid constituted 41.95%. Most of them were intramural or sub serous in location (30.24%) while the rest were sub mucous. This high incidence of uterine fibroids on HSG is similar to findings in South Eastern Nigeria by Mgbor (50%),<sup>18</sup> whereas a much lower incidence (5.9%) was reported in Northern Nigeria.<sup>17</sup>



**Figure 1:** Submucous uterine fibroid



**Figure 3:** Severe case of Asherman's Disease



**Figure 2:** Bilateral Tubal Blockage



**Figure 4:** Bicornuate Uterus (Uterus Bicornis Unicollis)

**Table 3: Relationship between age group and frequency of uterine fibroids**

Age range (years)	Frequency	Percentage
21–25	2	2.08
26–30	16	16.67
31–35	32	33.33
36–40	34	35.42
41–45	12	12.50
46–50	0	0
51–55	0	0
Total	96	100

In our study, Fibroid associated abnormalities were commoner in the 36 – 40 age group (Table 3). This agrees with the general assertion that uterine fibroids are commoner with increasing reproductive age and lower parity.<sup>19,20</sup> Apart from the difficulties in achieving pregnancy, uterine fibroids, especially the sub mucous varieties (Figure 1), result in marked distortion and enlargement of the uterine cavity and are commonly responsible for repeated first and second trimester abortions.<sup>19-22</sup> A study in Ghana<sup>19</sup> observed that as age advanced, the number of patients with fibroids also increased but decreased after 40 years. This association was found to be statistically significant {contingency coefficient (cc) 0.21,  $p > 0.001$ }. Our young women should therefore be encouraged to marry in their mid-twenties after completing their higher education and start having children thereafter.

Tubal pathologies were the second most common abnormalities seen in this study, accounting for 31.70%. Most studies in Nigeria, and indeed other parts of the world however have tubal pathologies as the most common abnormalities.<sup>20,23-25</sup> They present as bilateral (Figure 2), unilateral tubal occlusions with or without hydrosalpinx as well as peritubular adhesions.

Pelvic infections are the commonest cause of tubal pathologies. Most of them result from poorly treated sexually transmitted disease like Gonorrhoea and Chlamydia infections.<sup>13,17</sup> Puerperal sepsis and other post-surgical complications involving the uterus and other pelvic organs have also been implicated.<sup>24</sup> Primary preventive measures as well as prompt proper treatment of pelvic infections must be encouraged in order to reduce the high incidence of infertility resulting from tubal abnormalities.

Of particular interest is the high percentage (9.26%) of uterine synechiae seen in our study. This is in contrast to other studies (5% Benin, 4.5%, Sokoto).<sup>6,17</sup> Complete uterine adhesion (Asherman's syndrome) (Figure 3) was seen in 5 (2.43%) patients. These abnormalities present as filling defects and narrowing of the cavity on HSG and are known to be associated with previous repeated surgeries involving the uterine cavity.<sup>26,27</sup>

The main congenital abnormalities seen in our studies were bicornuate uterus, 2.43% (four mild cases in arcuate form, and one case of uterine bicornisunicollis - Figure 4). Congenital abnormalities are uncommon worldwide with most studies recording similar low percentages. They are however frequently associated with repeated miscarriages.<sup>11,19,27</sup>

A major limitation of this study was its retrospective radiological centre-based analytical design hence important clinical data especially relating to parity, previous treatment/surgeries could not be obtained. It must also be stated that the technique of HSG as presently carried out in our centre is not completely in line with current imaging best practices. Imaging under Fluoroscopy, use of disposable plastic cannular, sono-HSG, HyCoSy, Hysteroscopy and Laparoscopy are options that should be explored.

## CONCLUSION

Although there is an array of modern, less invasive diagnostic modalities for monitoring women with infertility worldwide, some of these facilities are not available in most hospitals in Sub-Saharan Africa. This study reveals that a high percentage of infertile women in Calabar, Nigeria have abnormal HSG findings, hence the investigation still plays a major role in the evaluation and subsequent management of women with infertility. The commonest abnormalities in our study were noted in the uterus; especially those associated with uterine fibroids.

## RECOMMENDATION

We recommend that the Nigerian Government should equip our secondary and tertiary health institutions with modern non-invasive and more sensitive diagnostic imaging modalities to help physicians manage the scourge of infertility with minimal discomfort to the patients.

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## DECLARATION

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### Authors Contribution:

**DUE, AOA, DEB:** Concept, design, manuscript preparation, editing and review. **MIE:** Data analysis, editing and review

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