

Hysterosalpingography as treatment and diagnostic tool in the management of infertility in Nigeria

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Abstract

Hysterosalpingography (HSG) is a diagnostic modality still commonly used to evaluate tubal occlusion in infertility management. We evaluated the treatment benefit in achieving tubal patency and spontaneous pregnancy in women with bilateral tubal occlusion in our resource poor setting using water soluble contrast medium.

Objective: To assess the proportion of women that achieved tubal patency and spontaneous pregnancy following a repeat HSG in the evaluation of infertility and the associated factors.

Materials and Method: This is a retrospective study of 37 out of 180 women who achieved tubal patency and pregnancy after repeat HSG in the course of infertility evaluation over a period of 18 months.

Result: Out of 180 patients with bilateral tubal occlusion that had the repeat HSG, 37 achieved tubal patency (20.5%) and from which 24 became pregnant. This gave a pregnancy rate of 13.3%. The mean age of the participants was 35.76 ± 4.72 years. The age group of 36-40 years had the highest frequency while most of them were nulliparous and had left tubal occlusion at the distal portion.

Conclusion: Tubal patency and spontaneous pregnancy were achieved following repeat HSG in women with bilateral tubal occlusion undergoing infertility evaluation. HSG has both diagnostic and treatment uses in infertility management and it is cost effective.

Keywords: Hysterosalpingography; Patency; Occlusion; Pregnancy; Nigeria

1. Introduction

Infertility is the inability of a couple to achieve pregnancy after a year of unprotected intercourse [1]. It poses a psychological, emotional and financial burden to affected couples especially in Africa where high premium is placed on child birth and large family size and many of the citizens live below poverty line [2].

Among the causes of infertility in the Nigerian female, tubal factor, damage or occlusion is frequently common and accounts significantly for up to a third of female infertility [3]. Other causes are anovulation, endometrial or cervical factors [3, 4].

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In the evaluation of women for infertility, radiological investigation is essential to assess for tubal patency since fertilization takes place in the fallopian tube as well as migration of the fertilized ovum before its implantation at the endometrium. Tubal occlusion could affect one or both tubes and may involve the proximal, mid or distal part of the fallopian tube [3,4,5,6,7,8].

Hysterosalpingography (HSG), an outpatient radiological modality is utilized in assessing for tubal patency, endometrial cavity and cervix. This involves the insertion of a cervical cannula or intrauterine catheter aseptically and the instillation of a water soluble or oil immersion contrast medium to outline the cervix, endometrial cavity, tubes and also to show the spillage into the peritoneal cavity following an X-ray [7,8].

Though there are other recent radiological methods of investigating the female genital tract for infertility like transvaginal sonography, saline infusion sonography (SIS), hysterosalpingo-contrast sonography (HyCoSy) and magnetic resonance hysterosalpingography, hysterosalpingography is still the superior modality for detection of tubal pathology, specifically tubal obstruction [9,10,11,12]. These other methods are either not universally available or exorbitant [9]. The HSG has a sensitivity of 91.6% and specificity of 100% for evaluating tubal patency [13].

The absolute contraindications to HSG are pregnancy, active pelvic infection and recent tubal or uterine surgery. Although HSG is a relatively safe procedure, it may be complicated by pelvic cramps or pain, pelvic infection, fever, nausea, vaso-vagal symptoms or even lymphogranuloma formation [4,5,6]. Despite the potential complications and disadvantages such as exposure to radiation and high false positive rate, HSG still remains one of the most commonly used imaging modalities for evaluating female infertility in most countries such as Nigeria, United States and United Kingdom [14,15].

Though tubal occlusion may be surgically managed by tuboplasty or salpingostomy it is known that some women who had HSG using oil based contrast medium in the evaluation of infertility had improved rate of pregnancy [6,7].

In our centre, we noticed that some consenting women who had a repeat HSG using a slightly higher dose of water soluble contrast medium achieved tubal patency and clinical pregnancy as evidenced by ultrasound diagnosis. This is why this retrospective study was done to evaluate the treatment benefit and not only the diagnostic reliance on HSG in the management of infertility.

Objective

This study evaluated the proportion of women with bilateral tubal occlusion who achieved tubal patency and spontaneous pregnancy following a repeat hysterosalpingography in the evaluation of infertility and the associated factors.

2. Material and methods

This retrospective study evaluated women who achieved tubal patency and later spontaneous pregnancy after repeat hysterosalpingography (HSG) in their course of management of infertility at Savealife Mission Hospital, PortHarcourt, Nigeria between January 2018 and June 2019.

Out of 180 women with bilateral tubal occlusion that had repeat HSG in the period of study, 37 of them that achieved tubal patency were selected for the study. They had intrauterine catheterization for the instillation of 30 millilitres of urographin, a water soluble contrast medium for the procedure. The repeat HSG was done within 72 hours of the first HSG which was earlier done on the 7th day of the menstrual cycle.

Their case files, HSG films and reports were retrieved from the Medical records and Radiology departments respectively. The information obtained were age, parity, type of infertility, ultrasound confirmation of pregnancy and the duration between the repeat HSG and confirmation of pregnancy. The HSG report showed tubal patency or occlusion, number of tubes in which patency was achieved and the position of tubal occlusion on the first HSG. The data was analysed with IBM's Statistical Package for Social Sciences (SPSS) version 23.0 for windows and presented on frequency distribution tables, mean and standard deviation, bar and pie charts. P value less than 0.05 was statistically significant.

3. Results

Out of the 180 patients with bilateral tubal occlusion that had repeat hysterosalpingography (HSG), 37 of them had their tubal patency restored (20.5%) and from which 24 of the participants achieved pregnancy. This gave a pregnancy rate of 13.3%.

Table 1 below shows the demographic characteristics of the participants. The age group of 36-40 years had the highest tubal patency achievement among the women (48.6%) while the nulliparous group was the most group to achieve tubal patency based on parity.

Table 1 Demographic characteristics of the subjects

	Frequency	Percent
Age group		
26 – 30	7	18.9
31 – 35	6	16.2
36 – 40	18	48.6
41 – 45	6	16.2
Parity		
0	27	73.0
1	8	21.6
2	1	2.7
3	1	2.7

The mean age is 35.76 ± 4.72 , while the age range is 26 – 42 years.

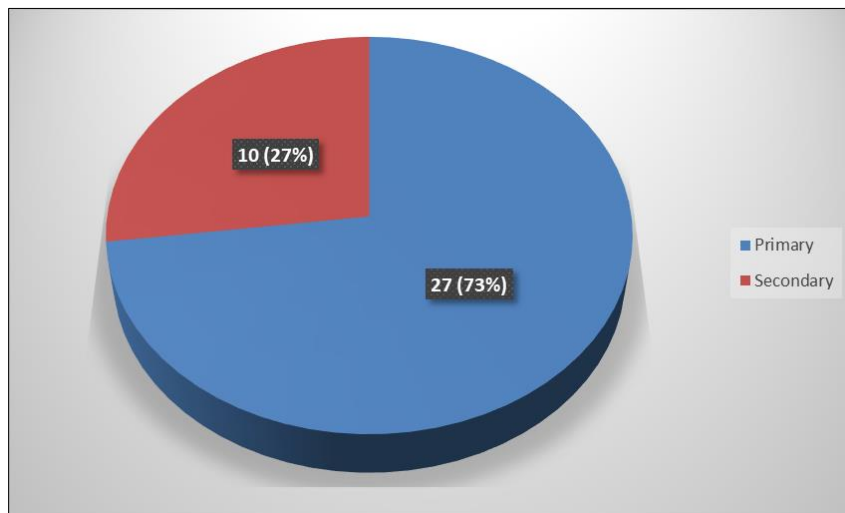


Figure 1 Type of infertility

As seen in figure 1 above, 72.9% of the women had primary infertility.

Figure 2 below shows that 24 of the participants achieved pregnancy

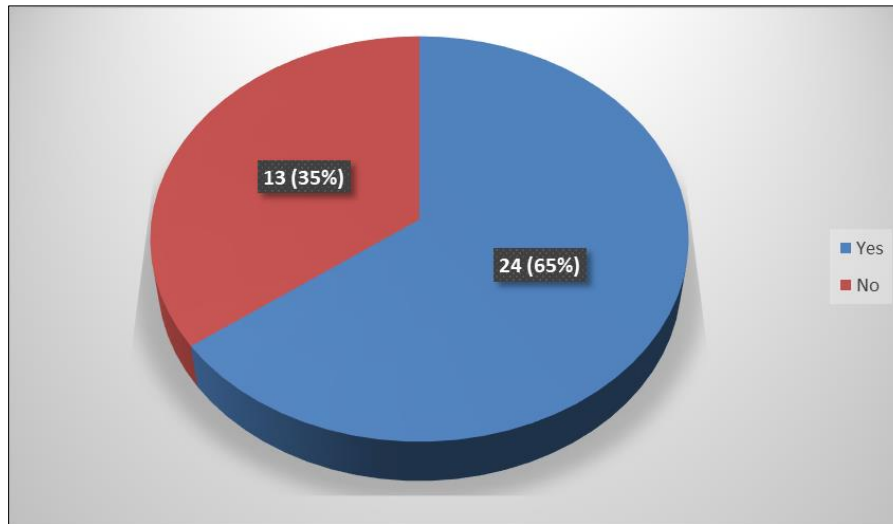


Figure 2 Pregnancy

Table 2 captures the duration between the repeat hysterosalpingography (HSG) and achieving of pregnancy. This shows that 62.5% of the participants achieved pregnancy within 5 months while 37.5% of them got pregnant after 5 months but before a year of having the repeat HSG.

Table 2 Duration between repeat HSG and pregnancy

	Frequency	Percent
1 – 5 months	15	62.5
>5 months	9	37.5

Mean duration is 4.79 ± 2.23 , while the range is 2 – 12 months.

Figure 3 showed the tube in which patency was achieved after the procedure. More than half of the participants achieved tubal patency on the left tube (59.5%), 11 of them (29.7%) achieved on the right tube while 4 of them achieved patency on both tubes (10.8%).

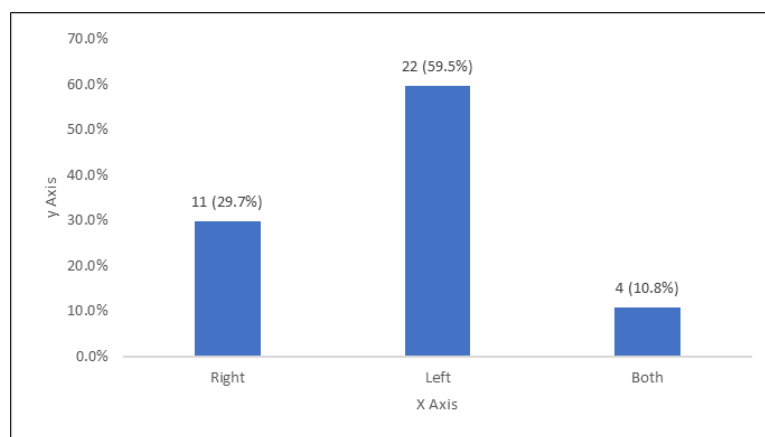


Figure 3 Tube in which patency was achieved

Figure 4 below is the representation of the portions of the tube which were occluded from the 1st HSG and in which patency was achieved after the repeat HSG in form of a bar chart. Most of the patients (62.2%) had occlusion restored at the distal portion of the tube.

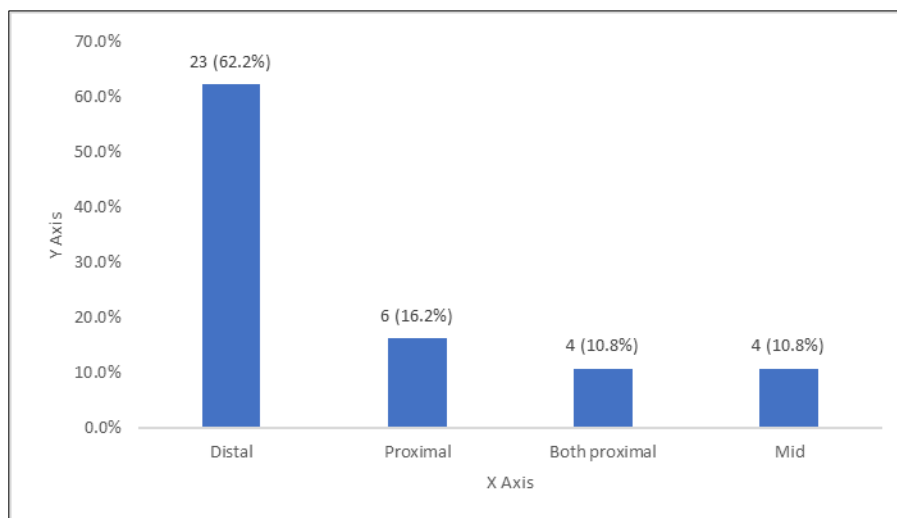


Figure 4 Position of occlusion on the tubes before repeat HSG

4. Discussion

Hysterosalpingography (HSG) is a veritable investigation commonly used for the assessment of tubal patency in women undergoing infertility work up [16]. Tubal occlusion itself is a leading cause of infertility accounting for a third of infertility cases in Nigeria [3].

One hundred and eighty patients with bilateral tubal occlusion underwent repeat HSG in our study and 37 of them achieved tubal patency. Among them, 24 achieved spontaneous pregnancy thereby having a pregnancy rate of 13.3%.

The mean age of the women that achieved tubal patency after HSG was 35.76 ± 4.72 years with an age range of 26 to 42 years. This was similar to the mean age of 34.9 ± 5.53 years of women that had HSG in a similar study but less than that of 38.4 ± 0.3 years and age range of 24 to 50 years in another related study [2, 3]. The age group of 36-40 years constituted the highest frequency among the participants that had HSG and tubal patency in our study. This is higher than 30-34 years group from a related study [3]. This 36-40 years group with occluded tubes and later patency corroborates with the finding that women tend to have decline in fertility as from 35 years and the older women are more likely to have tubal infertility than younger ones [17].

There were more nulliparous women among those that achieved tubal patency after HSG (73%). This was higher than 65.4% obtained for nulliparous women as the highest group of women based on parity from a related study [2].

Most of the patients we studied had primary infertility constituting 72.9% of the participants. This is similar to a Thailand based study with more primary infertility [18]. Our finding however contrasts with some other studies that had a preponderance of their patients having secondary infertility [19, 20, 21].

From our study, 24 of the participants achieved spontaneous pregnancy thereby giving a pregnancy rate of 13.3%. This is lower than 35% pregnancy rate obtained from a related study in Netherlands using water based contrast medium [22]. This affirms that hysterosalpingography can improve the pregnancy rate in women being managed for infertility [23, 24, 25].

Hysterosalpingography, though originally a diagnostic test has been suggested for many years to improve pregnancy rates in infertile women due to its possible therapeutic effect on tubal flushing [26]. This was established more on those that used oil based contrast media where it has increased pregnancy rate by 10% [22]. The use of oil based contrast medium however has more complications of intravasation and embolism than the water based contrast though no embolism has been reported from previous studies [27, 28, 29].

In our resource poor setting where oil based contrast medium is expensive and not readily available, the use of water based contrast medium in a repeat HSG procedure within 72 hours improved the chances of achieving pregnancy. It was also cost saving for the women from surgical procedures like tuboplasty or salpingostomy or possible assisted

conception procedures like in vitro fertilization which are exorbitant and not readily available in our environment. The use of intrauterine catheterization to mechanically instill the water soluble contrast might have contributed to achieving tubal patency and pregnancy in the women studied. A similar study showed the use of infusion pump to instill the dye during HSG [22].

In our study, 62.5% of the participants achieved pregnancy before the end of 5 months after the repeat HSG. This was similar to a previous study in which 29.1% achieved pregnancy within 6 months of HSG [22]. This period of achieving pregnancy in our study was compatible with Hanault's prediction of women achieving spontaneous pregnancy in less than 12 months after HSG [30].

On the tube with more occlusion cases before the HSG; more than half of the women studied (59.5%) had occlusion and patency restored on the left tube. A similar study showed more left tubal occlusion while another study revealed predominant right tubal occlusion [18, 31]. Only 10.8% of the participants had bilateral tubal occlusion and then patency after HSG. This might have been due to tubal spasm occluding the cornual ends of the tubes in the first HSG. The use of antispasmodics during the HSG could have prevented the tubal spasm and occlusion which then allowed the passage of the contrast. Bello et al, made a similar observation [32]. Most of the patients (62.2%) had the distal portion of their tubes occluded before patency was restored. This is higher than 8.42% obtained in a related study [18]. Hysterosalpingography is still relevant as a diagnostic procedure to assess tubal patency in patients undergoing infertility evaluation in our resource poor setting. The achievement of pregnancy in this study buttresses that HSG has treatment benefit as well, even with the use of water based contrast medium.

5. Conclusion

The tubal patency rate of 20.5% and pregnancy rate of 13.3% respectively were achieved following repeat hysterosalpingography using water based contrast medium in women with bilateral tubal occlusion undergoing infertility evaluation. This was noticed mostly in young nulliparous women below 40 years with the occlusion of the distal portions of their left tubes. HSG therefore has both diagnostic and treatment uses in infertility management and it is cost effective.

Compliance with ethical standards

Acknowledgments

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Disclosure of conflict of interest

The authors declare no conflict of interest.

Statement of ethical approval

This was obtained from the hospital's ethics committee.

Statement of informed consent

Informed consent was obtained from all the participants included in this study.

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