Tubal abnormalities on hysterosalpingography in primary and secondary infertility

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Summary

Background: Hysterosalpingography (HSG) is an imaging modality used in assessing the fallopian tubes of patients with infertility. There have been reports suggesting that tubal pathologies may be responsible for most cases of secondary infertility.

Objective: To evaluate the fallopian tube of women with infertility and to observe if there are significant differences in the tubal findings in primary and secondary infertility.

Methodology: One hundred and twenty (120) patients attending the outpatient fertility clinics in University of Ilorin Teaching Hospital, (UITH) Nigeria were studied; Twenty-four (20%) presented with primary infertility and Ninety-six (80%) with secondary infertility. All the patients had HSG.

Results: A total of 48(40%) patients out of the 120 studied had a tubal pathology, out of which 43 (44.8%) had secondary infertility and 5 (20.8%) had primary infertility. Tubal pathology was found to be significantly associated with secondary infertility than primary infertility (P < 0.05, Odds ratio = 3, CI = 95%).

Key-words: Hysterosalpingography, Infertility, Hydroaspinx, Tubal blockage.

Résumé

Introduction: L’hystérosalpingographie (HSG) est une modalité d’imagerie utilisée dans l’évaluation du trompe de Fallope des patients atteints de la stérilité. Déjà, il ya des rapports qui suggèrent que des pathologies tubales pourraient être attribuables à la plupart des cas de la stérilité secondaire.

Objectif: Evaluer les trompes de Fallope des femmes avec la stérilité et stérilité secondaire.

Méthodologie: Cent vingt patients qui viennent consulter au centre médical de la stérilité du centre hospitalier universitaire d’Ilorin (CHUI) Nigéria ont été étudiés. Vingt quatre soit (20%) étaient atteints de la stérilité primaire et quatre vingt seize soit (80%) avec la stérilité secondaire. Tous les patients avaient HSG.

Résultats: Un total de 48 soit 40% des patients parmi 120 étudiés étaient de la pathologie tubale, dont 43 soit 44,8% étaient atteints de la stérilité secondaire et 5 soit 20,8% étaient atteints de la stérilité primaire. La pathologie tubale était trouvée d’être sensiblement liée avec la stérilité secondaire plus que la stérilité primaire (P < 0,05, chances proportions = 3, CI = 95%).

Introduction

Infertility is defined as the inability of a couple to achieve conception after twelve months, or more of unprotected coitof average frequency.1 The prevalent rate of infertility is hard to assess accurately, however, several studies have reported between 5 - 15% in developed countries.1 In tropical Africa infertility rate is between 10% - 20%, although prevalence rates of up to 30% and even 50% have been reported in the Congo.2

A major cause of infertility in sub-Saharan Africa is Pelvic Inflammatory disease (PID), usually due to Neisseria gonorrhoeae.3 It has been estimated that PID - related tubal adhesions, causes 30 - 50% of all cases of female infertility, even with treatment, bilateral tubal occlusion was noted in 20% of cases in one series done in Kenya.2

Hysterosalpingography (HSG) is an imaging modality that utilizes contrast media and radiographic techniques to visualize the uterine cavity and lumen of the fallopian tubes.

Some authors have documented the radiological patterns of diseases on HSG as seen in Nigerian women,4 this study is to assess if there is any significant differences in the HSG tubal findings in primary and secondary infertility.

Materials and methods

The study was carried out at the University of Ilorin Teaching Hospital (UITH), Nigeria.

The study was a 12-month prospective study from January 2000 to December 2000 of 120 consecutive patients referred from the outpatient infertility clinics of the University of Ilorin Teaching Hospital (UITH) for hysterosalpingography. A structured questionnaire was used to obtain relevant data such as type and duration of infertility, previous allergies, presence of uterine bleeding, vaginal discharge and post-procedure complications.

Hysterosalpingography was done between the 7th and 10 day of the menstrual cycle. The patients were positioned in the lithotomy position on the X-ray table and premedicated with IV Hyoscine N Butylbromide (20mg) five minutes before the beginning of the procedure. They were reassured and under bright illumination, a Cusco’s speculum was inserted into the vagina, and opened to visualize the cervical os, which was then cleaned with Savlon. The cervix was held with a Volsellum forceps, and a Leech Wilkinson or an Ewaldt Williams canula was inserted into the distal end of the cervical canal. While maintaining a tight seal between the cervical canal and the canula, a water-soluble contrast medium Urografin 76% was injected slowly into the uterine cavity and the fallopian tubes. About 7 to 10mls produced good uterine visualization; larger quantities usually obscured subtle defects.

Pelvic radiographs were obtained in the AP supine and right oblique position during the injection of the contrast medium. A radiograph was obtained in the supine position 30 minutes after completion of the procedure to assess the

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degree of loculation of contrast, if any. The films were studied initially in the wet film phase to allow for adjustment in technique in order to obtain a better radiograph while the patient was still on the examination table.

All the HSGs were performed under the supervision of the author.

Data was analyzed using SPSS version 19, computer software for statistical analysis.

**Results**

One hundred and twenty women (120) with infertility were involved in this study. Their ages ranged between 19 years and 39 years, with a mean of 29.8 years. Twenty-four patients (20%) had primary infertility, while Ninety-six patients (80%) had secondary infertility.

The duration of infertility ranged from 1 year to 18 years with a mean duration of 4.24 years. Bilateral normal tubes with normal size and showing free intraperitoneal spillage were seen in 19 out of the 24 patients with primary infertility (79.2%) and in 53 out of the 96 patients with secondary infertility (55.2%). Table 1, demonstrates the relationship between the type of infertility and the presence of a tubal abnormality in primary and secondary infertility and normal bilateral tubes.

<table>
<thead>
<tr>
<th>Infertility</th>
<th>Normal bilateral tubes</th>
<th>Presence of tubal pathology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary</td>
<td>19</td>
<td>5</td>
</tr>
<tr>
<td>% within infertility</td>
<td>79.2%</td>
<td>20.8%</td>
</tr>
<tr>
<td>Secondary</td>
<td>53</td>
<td>43</td>
</tr>
<tr>
<td>% within infertility</td>
<td>55.2%</td>
<td>44.8%</td>
</tr>
<tr>
<td>Total</td>
<td>72</td>
<td>48</td>
</tr>
<tr>
<td>% within infertility</td>
<td>60.0%</td>
<td>40.0%</td>
</tr>
</tbody>
</table>

*a* person chi-square test for significant *P* < 0.05

*b* Fisher’s exact test for significance has a *P* value < 0.05

**Table 2** Pattern of tubal findings demonstrated on HSG cross-tabulated with infertility

<table>
<thead>
<tr>
<th>Fallopian tube blockage and spillage on HSG in patients with infertility in Ilorin</th>
<th>Both normal</th>
<th>Unilateral blockage</th>
<th>Unilateral hydrosalpinx</th>
<th>Bilateral blockage</th>
<th>Bilateral hydrosalpinx</th>
<th>Blockage and spillage on HSG</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary</td>
<td>19(79.2%)</td>
<td>1(4.2%)</td>
<td>0(0%)</td>
<td>1(4.2%)</td>
<td>3(12.5%)</td>
<td>0(0%)</td>
<td>24(100%)</td>
</tr>
<tr>
<td>Secondary</td>
<td>53(55.2%)</td>
<td>10(10.4%)</td>
<td>9(9.4%)</td>
<td>8(8.3%)</td>
<td>11(11.5%)</td>
<td>5(5.20%)</td>
<td>96(100%)</td>
</tr>
<tr>
<td>Total</td>
<td>72(60%)</td>
<td>11(9.2%)</td>
<td>9(7.5%)</td>
<td>9(7.5%)</td>
<td>14(11.7%)</td>
<td>5(4.2%)</td>
<td>120(100%)</td>
</tr>
</tbody>
</table>

**Fig. 1** HSG showing distalation of the ampulla of the left fallopian tube in keeping with hydrosalpinx. The right fallopian tube is not visualized suggestive of blockage.

**Fig. 2** HSG demonstrating right hydrosalpinx, not the failure to visualize the left fallopian tube suggestive of blockage.
pathology, either a blockage or hydrosalphinx in either or both tubes. Forty-eight patients out of the 120 patients studied had a tubal pathology, out of which 43 (44.8%) had secondary infertility and 5 (20.8%) had primary infertility. The probability of occurrence of a tubal pathology is higher in secondary infertility than in primary infertility ($P < 0.05$, Odds ratio $= 3$, CI = 95%).

Hydrosalphinx either bilateral or unilateral was the most common tubal abnormality; it was present in 28 patients made up of 25 (26.0%) patients with secondary infertility and 3 (12.5%) patients with primary infertility ($P < 0.05$). Bilateral hydrosalphinx was seen in 11 (11.5%) patients with secondary infertility and 3 (12.5%) patients with primary infertility. (Table 2) Unilateral hydrosalphinx was noted in secondary infertility alone, none in primary infertility; it was observed in 9 (7.5%) patients (Fig. 1 & 2). Right unilateral hydrosalphinx was more frequent occurring in 5 patients. Hydrosalphinx in conjunction with a tubal blockage was observed in 5 (5.2%) patients with secondary infertility, none in primary infertility.

Bilateral cornual blockage was observed in 9 patients. Eight of the patients had secondary infertility (8.3%) and 1 patient had primary infertility (4.3%) ($P < 0.05$) (Fig. 3 & Table 2).

Unilateral tubal blockage (in the proximal 1/3) associated with a normal tube was observed in 11 patients, out of which 10 patients presented with secondary infertility, in this group 9 cases had blocked left tube, and 2 cases had right tubal blockage.

Discussion

Infertility is a major public health problem in Africa, since childlessness is seen as a major personal tragedy and can result in marital instability and suicidal tendencies.

Tubal abnormalities were observed in 20.8% and 44.8% of primary and secondary infertility respectively. Earlier researchers also obtained higher rates of tubal abnormalities in secondary infertility comparable to the results of this study. Belsey suggested that the higher rates seen in secondary infertility could be used as a crude indicator of the possible effects of post abortal and post partum infection.

Hydrosalphinx is defined as dilation of the ampular of the fallopian tube with thinning of adherent fimbriae and destruction of the mucosa. Hydrosalphinx (both bilateral and unilateral) occurred in 28 patients of the 120 women evaluated, comprising of twenty-five patients (26%) with secondary infertility and 3 (12.5%) patients with primary infertility ($p < 0.05$).

Hydrosalphinx is the most common tubal pathology reported in most studies, including this survey (Fig 1 & 2). Unilateral hydrosalphinx was noted in secondary infertility alone, the author cannot deduce any reason for this finding; however more extensive study needs to be done to evaluate the importance. Moreover it is more common on the right side, 5 cases when compared to 4 cases on the left. Hydrosalphinx in conjunction with a tubal blockage was also noted in secondary infertility alone. These findings support the theory that most cases of secondary infertility may be related to tubal factor.

Bilateral cornual blockage was noted in 8 (8.3%) cases of secondary infertility and 1 (4.2%) case of primary infertility ($p < 0.05$) (Fig. 3). However, it may be difficult to differentiate tubal obstruction from bilateral cornual spasm and those due to technical reasons, such as under filling. Horwitz et al described cornual spasm radiologically, as spasm characterized by rounded smooth cornual margin whereas cornual occlusion was characterized by pointed or irregular cornual margin, these radiological features are difficult to evaluate objectively. Laparoscopy and dye test have proved superior to HSG in differentiating cornual spasm from cornual occlusion. In this study, none of the patients had laparoscopy because it was not available in our centre.

A newly described radiological technique; selective ostial salpingography can be used to differentiate true mechanical obstruction from spasm without subjecting the patient to laparoscopy. In this technique, obstructed fallopian tubes were recanalised with a combination of platinum tipped guide wire and 3-F Teflon catheter.

In conclusion, 48 patients in this study had a tubal pathology, either a blockage, or hydrosalphinx. In this group 5 patients (20.8%) had primary infertility and 43 patients (44.8%) had secondary infertility ($P < 0.05$, OR = 3, CI = 95%). This study demonstrates a statistically significant difference in the occurrence of tubal pathology in primary and secondary infertility.

References


