

Tubal abnormalities on hysterosalpingography in primary and secondary infertility

T. O. Bello

Department of Radiology, Lautech College of Health Sciences
P. M. B. 4400, Oshogbo.
E-mail: bellotope@hotmail.com

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, Hydrosalpinx, Tubal blockage.

Résumé

Introduction: L'hystérosalpingographie (HSG) est une modalité imageur utilisée dans l'évaluation du trompes de Fallope des patients atteints de la stérilité. Déjà, il ya des rapports qui suggerent que des pathologies tubales pourraient être attribuable a 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 coi-

tus of 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,^{3,4,5} 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 Wilkinsons or an Everald 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

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 10, 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 39years, with a mean of 29.8years. 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

Table 1 Pattern of tubal findings (both normal and the presence of a tubal abnormality) cross tabulated with infertility

Infertility	The presence of a tubal abnormality in primary and secondary infertility and normal bilateral tubes			Total
		N	Normal bilateral tubes ^a	
			Presence of tubal pathology ^b	
Primary	N	19	5	24
	% within infertility	79.2%	20.8%	100.0%
Secondary	N	53	43	96
	% within infertility	55.2%	44.8%	100.0%
Total	N	72	48	120
	% within infertility	60.0%	40.0%	100.0%

a person chi-square test for significant P <0.05

b 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

	Fallopian tubal findings on HSG in patients with infertility in Ilorin						Total
	Both normal	Unilateral blockage	Unilateral hydrosalpinx	Bilateral blockage	Bilateral hydrosalpinx	Blockage and hydrosalpinx	
Primary	19(79.2%)	1(4.2%)	0(0%)	1(4.2%)	3(12.5%)	0(0%)	24 (100%)
Secondary	53(55.2%)	10(10.4%)	9(9.4%)	8(8.3%)	11(11.5%)	5(5.20%)	96 (100%)
Total	72(60%)	11(9.2%)	9(7.5%)	9(7.5%)	14(11.7%)	5(4.2%)	120 (100%)



Fig. 1 HSG showing dilatation of the ampular 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.



Fig. 3 HSG demonstrating bilateral cornual blockage.

pathology, either a blockage or hydrosalpinx 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%).

Hydrosalpinx 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 hydrosalpinx was seen in 11 (11.5%) patients with secondary infertility and 3 (12.5%) patients with primary infertility. (Table 2) Unilateral hydrosalpinx was noted in secondary infertility alone, none in primary infertility; it was observed in 9 (7.5%) patients (Fig. 1 & 2). Right unilateral hydrosalpinx was more frequent occurring in 5 patients. Hydrosalpinx 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.²

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.^{3, 4, 5, 6, 7} 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.²

Hydrosalpinx is defined as dilatation of the ampullar of the fallopian tube with thinning of adherent fimbriae and destruction of the mucosa.⁸ Hydrosalpinx (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 ($p < 0.05$).

Hydrosalpinx is the most common tubal pathology reported in most studies,^{7, 8, 9} including this survey (Fig 1 & 2). Unilateral hydrosalpinx 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. Hydrosalpinx 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,⁷ these radiological features are difficult to evaluate objectively. Laparoscopy and dye test have proved superior to HSG in differentiating cornual spasm from cornual occlusion.^{3, 4} 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.^{10, 11}

In conclusion, 48 patients in this study had a tubal pathology, either a blockage, or hydrosalpinx. 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

1. Pollard Irinia. A guide to reproduction: Social Issues and Human Concerns. Cambridge University Press. Cambridge, 1994; 3 - 17.
2. Besley. WHO Report. The Epidemiology of Infertility. A review with particular reference to Sub Saharan Africa. Bulletin of the World Health Organization 1976; 54: 319 - 345.
3. Ladipo O A. Tests of Tubal Patency. Comparison of Hysterosalpingography and Laparoscopy. British Medical

- Journal. 1976; 2: 1297 - 1298.
4. Ladipo O A. An evaluation of 576 Hysterosalpingogram on Infertile Women. *Infertility*. 1979; 2: 63 - 78.
 5. Oditia J C. Hysterosalpingography in Nigerian Women: An analysis based on 500 cases. *Tropical Doctor*. 1987; 1: 7 - 11.
 6. Rice J P, Hondous S N and Olive R L. Re-evaluation of Hysterosalpingography in Infertility Investigations. *Obstetrics and Gynecology*. 1986; 67:718 - 721.
 7. Horwitz R C, Morton P C, Shaft M I and Hugo P. A radiological approach to infertility - hysterosalpingography. *British journal of radiology*, 1979; 52: 255 - 262.
 8. Lees W R and Highman J H. Gynecological imaging. In Sutton D (ed). *Textbook of radiology and imaging 6ed*, Churchill-Livingstone, Edinburgh and London 1998; 1261 - 1269.
 9. Sanfilippo JS, Yussman MA and Smith O. Hysterosalpingography in the evaluation of Infertility; A Six-year Review. *Fertility and Sterility* 1978; 30: 636 - 643.
 10. Thurmond A S, Barry U and Josef Rosch. Device for Hysterosalpingography and fallopian tube catheterization. *Radiology* 1990; 174: 571 - 572.
 11. Thurmond A S and Rosch J. Fallopian Tubes: Improved techniques for catheterization. *Radiology* 1990; 174: 572 - 573.