

Hysterosalpingographic Findings in Infertility Patients

Dr. Subuhi N¹, Dr. Gautam S. Aher², Dr. Shinde U^{3*}

¹Resident, Dr. Vitthalrao Vikhe Patil Foundation's Medical College Ahmednagar, Maharashtra, India

²Professor and HOD, Dr. Vitthalrao Vikhe Patil Foundation's Medical College Ahmednagar, Maharashtra, India

³Associate Professor, Dr. Vitthalrao Vikhe Patil Foundation's Medical College Ahmednagar, Maharashtra, India

*Corresponding author: Dr. Shinde U

| Received: 18.11.2018 | Accepted: 28.11.2018 | Published: 30.01.2019

DOI:10.21276/sjmps.2019.5.1.15

Abstract

Introduction: Fallopian tube patency, morphology of the uterus and cervix can be assessed by Hysterosalpingogram. Hysterosalpingography is still a commonly used investigation in the evaluation of female infertility. **Objectives:** The objectives of the study is to evaluate the structural abnormalities of the uterus and fallopian tubes in infertile women. **Methods:** A retrospective review of 110 patient in whom hysterosalpingography was performed for infertility between Aug 2017 to July 2018 in the Department of Radiology. Clinical notes and radiological finding were analyzed for demographic data, uterine, tubal and pelvic pathology. **Results:** The commonest age group seen was 20-25 years. Primary infertility was commoner than secondary infertility. On hysterosalpingography 8 patients had congenital uterine anomalies. In 3 cases there is filling defect due to fibroid. Related to tubal findings among 110 patients 71 had normal fallopian tube with bilateral spillage. **Conclusion:** Tubal and uterine pathologies play major role in female infertility. HSG is important tool in detecting birth canal pathologies.

Keywords: Hysterosalpingography, Infertility, Fallopian tube, Uterus.

Copyright © 2019: This is an open-access article distributed under the terms of the Creative Commons Attribution license which permits unrestricted use, distribution, and reproduction in any medium for non-commercial use (NonCommercial, or CC-BY-NC) provided the original author and source are credited.

INTRODUCTION

Infertility affects 15 % couple of reproductive age group. It is defined as the inability of a couple to conceive after 12 months of regular unprotected sexual intercourse [1]. Infertility is known as primary if the women had never been pregnant, whereas secondary infertility indicates previous pregnancy which may or may not have led to live birth, but failure to conceive subsequently [2].

Infertility in women may be because of disorders of fallopian tubes, uterus, cervix and ovaries. Tubal and peritoneal pathology is most common cause of infertility and the primary diagnosis in approximately 35–40% [3]. Fallopian tube patency, morphology of the uterus and cervix can be assessed by hysterosalpingogram, which is a safe, relatively inexpensive, simple and rapid diagnostic test [4], compared to other methods of evaluation of these structures. Common indications for obtaining HSG are evaluation of tubal patency as part of an infertility workup and of congenital uterine anomalies [5].

For assessment of uterine cavity and fallopian tubal patency, HSG is reliable test but it has low sensitivity for diagnosis of pelvic adhesion. It has a sensitivity of 65% and a specificity of 83% for

diagnosis of tubal patency [6]. Hysterosalpingography may have a therapeutic role in enhancing subfertility [7].

Diagnostic hysteron laparoscopy (DHL) has emerged as the essential tool for the evaluation of female infertility and is considered as gold standard investigation for tubal patency and uterine pathology [8]. However, the superiority of HSG in detecting uterine and intraluminal tubal pathology [9], its easy availability and cost effectiveness still makes it the procedure of choice for evaluating female infertility in low resource countries.

Other imaging modalities which can be used in assessing infertility in females include ultrasound and magnetic resonance imaging. Transvaginal ultrasound can be a useful diagnostic tool, which could be complemented by saline or hysterosalpingo contrast sonography (HyCoSy). Saline or hysterosalpingo contrast sonography defines the size and shape of uterine cavity and has high positive predictive value for detection of endometrial polyp, submucous myoma and synechiae but has limited value in the assessment of tubal abnormalities. Magnetic resonance imaging is considered as gold standard for imaging congenital uterine anomalies and uterine wall lesions but has limited role in fallopian tube assessment.

The aim of the study is to evaluate the structural abnormalities of the uterus and tubes in infertile women as elucidated by hysterosalpingography.

Objectives

To highlight the abnormalities identified on HSG, and their relationship with infertility.

MATERIALS AND METHODS

This is a retrospective review of 110 HSG studies carried out at the radiology department of Dr. Vitthalrao Vikhe Patil Medical College.

The data was collected from Radiology Department of our institution where HSG was done by radiologists and gynaecologist, who also interpreted the

results thereafter. The HSG was performed during 7–12 days of the menstrual cycle. Because during this proliferative phase endometrium was thin and facilitate image interpretation and ensured that there was no existing pregnancy. Patients with pregnancy, active pelvic inflammatory disease, bleeding and severe allergy to iodine-based contrast agents were excluded.

HSG films were interpreted by the visualization of hard copy images, checking for unilateral and bilateral spillage of contrast medium into the pelvic cavity and abnormalities in the outline of the uterus and cervix.

RESULTS

A total of 110 HSG studies of women were reviewed. Maximum women were in the age group 20-25 years, followed by women in age group 26-30 years.

Table-1: Age Distribution

Age	No. of Pts	Percentage (%)
20-25	58	53
26-30	42	38
>30	10	9
Total	110	100

There were 63 cases of primary infertility and 47 cases of secondary infertility. The mean age of

women with primary infertility was 24 years, whereas that for secondary infertility was 27 years.

Table -2: Type of Infertility

Type of infertility	No of cases	Percentage (%)
Primary	63	57.2
Secondary	47	42.7
Total	110	100

Of 110 infertile patients studied ,66 patient(60 %) had < 5 years of duration of infertility, 36

patient was infertile since 6-10 years and 8 patient was infertile since 11-15 years.

Table-3: Duration of Infertility

Duration (years)	Primary	Secondary	Total
1-5	48	18	66
6-10	15	21	36
11-15	3	5	8

Incidence of tubal factor is more common in secondary infertility. Related to tubal findings among 110 patients, 71 patients had patent tubes with bilateral spillage. 7 cases of primary infertility were of bilateral blocked tube and 10 patient had unilateral block. 8

cases of secondary infertility had both tubes blocked and 14 cases had one tube blocked. One patient had bilateral beaded fallopian tube. Hydrosalpinx was present in 7 cases.

Table-4: Incidence of Tubal Factor In Primary And Secondary Infertility

Type of infertility	Both patent tube	Both blocked tube	One tube blocked
Primary	46	7	10
Secondary	25	08	14

Uterine cavity with smooth surface was found in 101 cases and irregular with filling defect was present in 9 cases. The size of uterus was within normal limit in 106 cases and large in 1 and small in 3 cases.

On hysterosalpingogram examination out of 110 pts, among congenital abnormalities of uterus one pt. was having arcuate uterus, three were with septate uterus, three patients were having bicornuate uterus and one

was with uterus didelphys. There were 3 cases with uterine leiomyoma on HSG and 6 patients had uterine

synechiae. There was only one case of cervical abnormality which include cervical synechiae.

Table-5: Distribution of Uterine Contour And Size

Uterus	Primary infertility	Secondary infertility
Size		
Normal	60	46
Small	2	1
Large	1	-
SHAPE		
Normal	61	41
Bicornuate	1	2
Arcuate	-	1
Uterus didelphys	-	1
Septate uterus	1	2
Surface		
Smooth	59	42
Irregular with filling defect	3	6



A normal size uterine cavity with both fallopian tubes demonstrated and there was free spillage of the contrast material. Both the cervical canal and uterine cavity are normal in outline.



HSG showing both fallopian tubes blocked with no free spillage of dye



Intrinsic filling defect due to adhesions



Beaded appearance of fallopian tube



Uterus didelphys, having two uterine cavities



HSG showing arcuate uterus



HSG showing bicornuate uterus

DISCUSSION

As HSG allows assessment of both tubal and intrauterine pathology, it is reasonable initial imaging technique to use in basic infertility evaluation. Hysterosalpingogram shows the general configuration of the uterine cavity and indicates endometrial lesion as filling defect or the irregularities of the intrauterine wall. HSG has high specificity and sensitivity for diagnosing distal tubal occlusion but much lower specificity for diagnosing proximal tubal occlusion. Many other advanced and efficient methods are available for uterine cavity and fallopian tube evaluation, but hysterosalpingogram still has role and it is used widely because it is cheap, readily available and easy to interpret [10]. Although Hyster laparoscopy is considered as gold standard and provide more information than HSG, radiologic studies are valuable non-invasive procedures for detection of uterine and tubal pathology [11]. Recent studies have shown that sonohysterography is superior to HSG for assessing intrauterine abnormalities. In addition, sonohysterography is cheaper, more tolerable and is free of ionizing radiation [12].

The optimum time to perform HSG is at the end of the first week after the menstrual period. Because at this time the isthmus is at its most distensible and fallopian tubes are readily filled by contrast medium [13]. HSG is usually avoided in the second half of the menstrual cycle to prevent any possibility that the procedure might be performed after conception and because the risk of venous intravasation is high during this period which could lead to false positive diagnosis of cornual occlusion [14].

Though HSG is cheap and easy to perform, it has certain limitations. The most important disadvantage of the HSG is that it does not show the external contour of the uterus. Characterization of Mullerian anomalies can be difficult on HSG. For example, visualization of 2 uterine cavities on HSG does not aid in distinguishing septate, didelphys, and bicornuate uterus. Other drawback includes patients' discomfort, use of iodinated contrast and radiation exposure.

In this study primary infertility (57 %) is more prevalent than secondary infertility 43 %. Similar observation is made by previous researchers [15, 16]. Contrary to our finding some studies observed that secondary infertility is the most common indication for hysterosalpingography in infertile women [17-19].

In our study mean age of infertile women was 25 years and greatest number of the infertile women presenting for HSG were within the range of 25- 30 years.

In this study most common abnormality detected on HSG was tubal blockage, with bilateral tubal block seen in 14 %, which is higher than the 4% reported in Port Harcourt [20] but close to 18 % reported in Nnewi [21]. The high incidence of tuboperitoneal factor (35 %) found in this study supports infection as the leading cause of infertility. As HSG is not useful for detecting peritubal adhesions, its incidence may even be higher at laparoscopy which is better in evaluating extrinsic tubal pathology [9, 12]. High incidence of tuboperitoneal infertility can be reduced by primary prevention of reproductive tract infection.

Eight (7.2%) cases of congenital uterine abnormality was encountered in this study which is close to 10 (3.6 %) reported by Bukar *et al.*, [18], but higher than 3 (0.9 %) and 2 (0.8 %) cases reported by Danifulani *et al.*, [19], and Akinola *et al.*, [22].

Uterine synechiae, 6 (5.4 %) was the most commonly acquired uterine pathology detected on HSG followed by uterine fibroid in 3 patients (2.7%). This is similar to the finding of Asaleye *et al.*, [23] but contrast with that of Mgbor who found uterine fibroid as the leading uterine pathology [9]. The cause of uterine synechiae may be due to postpartum endometritis or overzealous curettage of a recently pregnant uterus.

CONCLUSION

HSG is very important diagnostic tool for the evaluation of infertile women, as it has high detection rate of uterine and tubal pathology. HSG is performed in an outpatient setting and is far less costly, and may

have some therapeutic value. When all these advantages are added its continued use become more evident.

REFERENCES

- Pundir, J., & Toukhy, T. E. (2010). Uterine cavity assessment prior to IVF. *Women's Health*, 6(6), 841-848.
- Panti, A., & Sununu, Y. (2014). The profile of infertility in a teaching Hospital in North West Nigeria. *Sahel Medical Journal*, 17(1), 7-7.
- Reis, M. M., Soares, S. R., Cancado, M. L., & Camargos, A. F. (1998). Hysterosalpingo contrast sonography (HyCoSy) with SH U 454 (Echovist) for the assessment of tubal patency. *Human reproduction (Oxford, England)*, 13(11), 3049-3052.
- Siegler, A. M. (1983). Hysterosalpingography. *Fertility and sterility*, 40(2), 139-158.
- Heasler, D. C., & Brant, W. E. (2008). Obstetrics and Gynecological Imaging. Radiology Recall. 2nd ed. 58.
- Khalaf, Y. (2003). Tubal subfertility. *Bmj*, 327(7415), 610-613.
- Lim, C. P., Hasafa, Z., Bhattacharya, S., & Maheshwari, A. (2011). Should a hysterosalpingogram be a first-line investigation to diagnose female tubal subfertility in the modern subfertility workup?. *Human reproduction*, 26(5), 967-971.
- Chanu, S. M., Pal, G. S. R., Panda, S., & Santa Singh, A. S. (2018). Diagnostic hysterolaparoscopy for evaluation of infertility: Our experience in a tertiary Care Hospital. *Journal of human reproductive sciences*, 11(1), 19.
- Mgbor, S. O. (2006). Pattern of Hysterosalpingographic findings in gynaecological patients in Enugu. *Nig Med J*, 47, 14-16.
- Onwuchekwa, C. R., & Orij, V. K. (2017). Hysterosalpingographic (HSG) pattern of infertility in women of reproductive age. *Journal of human reproductive sciences*, 10(3), 178.
- Idrisa, A., Ojiyi, E., & Hamidu, A. U. (2003). Hysterosalpingography versus Laparoscopy in the Evaluation of Female Infertility in Maiduguri, Nigeria. *Tropical Journal of Obstetrics and Gynaecology*, 20(1), 20-23.
- Case, A. M., & Pierson, R. A. (2003). Clinical use of sonohysterography in the evaluation of infertility. *Journal of Obstetrics and Gynaecology Canada*, 25(8), 641-647.
- Ronald, G. G. (1993). The female reproductive systems in: Grainger RG, Allison DJ, editors. *Diagnostic radiology*, 3, 1809-1869.
- Crofton, M. (2011). Gynecological Imaging. Textbook of Radiology and Imaging. 7th ed, (2), 1069.
- Okafor, C. O., Okafor, C. I., Okpala, O. C., & Umeh, E. (2010). The pattern of hysterosalpingographic findings in women being investigated for infertility in Nnewi, Nigeria. *Nigerian journal of clinical practice*, 13(3).
- Admassie, D., & Negatuy, Y. (2011). Evaluation of the fallopian tubes in infertile women by hysterosalpingography in Tikur Anbessa Hospital, Addis Ababa, Ethiopia. *International Journal of Nursing and Midwifery*, 3(11), 178-181.
- Imo, A. O. C., & Sunday-Adeoye, I. (2008). Radiological assessment of the uterus and fallopian tubes in infertile women at Abakaliki, Nigeria. *Nigerian journal of clinical practice*, 11(3), 211-215.
- Bukar, M., Mustapha, Z., Takai, U. I., & Tahir, A. (2011). Hysterosalpingographic findings in infertile women: A seven year review. *Nigerian journal of clinical practice*, 14(2), 168-170.
- Danfulani, M., Mohammed, M. S., Ahmed, S. S., & Haruna, Y. G. (2014). Hysterosalpingographic findings in women with infertility in Sokoto North Western Nigeria. *African Journal of Medical and Health Sciences*, 13(1), 19.
- Nwankwo, N. C., & Akani, C. I. (2005). Pattern of Hysterosalpingographic findings in infertility in Port Harcourt. *West Afr J Radiol*, 12, 15-19.
- Okafor, C. O., Okafor, C. I., Okpala, O. C., & Umeh, E. (2010). The pattern of hysterosalpingographic findings in women being investigated for infertility in Nnewi, Nigeria. *Nigerian journal of clinical practice*, 13(3).
- Akinola, R. A., Akinola, O. I., & Fabamwo, A. O. (2009). Pattern of genital tract abnormalities on hysterosalpingography in infertile patients in Ikeja, Nigeria. *The Nigerian postgraduate medical journal*, 16(1), 31-34.
- Asaleye, C. M., Adetiloye, V. A., & Oyinola, T. O. (2004). Review of hysterosalpingography reports done for infertility over a 10 year period. *Nig J Health Sci*, 4, 36-39.