



Radiodiagnosis

ROLE OF HYSTEROSALPINGOGRAPHY IN FEMALE INFERTILITY

Dr Dhananjay D Ghodke

Assistant Professor, Dept of Radiodiagnosis, MGIMS, Sewagram, Wardha, Maharashtra, India.

Dr Saurabh S Patil*

Assistant Professor, Dept of Radiodiagnosis, MGIMS, Sewagram, Wardha, Maharashtra, India.*Corresponding Author

ABSTRACT

Introduction: In present world infertility is one of the major concern of people involved in sexual relationships. Female infertility contributes to more than half of the burden and amongst it tubal causes are very common especially in the developing nations. Even with advent of newer cross sectional imaging modalities like pelvic MRI, imaging of fallopian tubes still remains an uncharted territory. Hysterosalpingography (HSG) was one of the first imaging modality used to evaluate the female genital tract is still used at large even today. In this article we tried to study the utility and indications of HSG in present scenario to evaluate the various pathologies causing infertility.

Aims: To study the role of hysterosalpingography in female infertility and identify the different pathologies seen on imaging.

Study design: Retrospective observational study. Images and reports of 41 patients who underwent HSG in past one year (1 August 2016 to 31 July 2017). Followup obtained for 1 year in form of any further successful conception.

Results: Infertility was divided as primary in 30 and secondary in 11 cases. Findings were normal in 27, 7 had tubal block, 1 each had peritubal adhesions, salpingitis isthmica nodosum and synechia while 2 each had submucosal fibroid and mullerian duct anomalies. On followup 4 cases with normal HSG conceived while that of abnormal only 2 conceived.

Conclusion: HSG is useful in identification of multiple genital tract abnormalities that are associated with infertility. It has ability to demonstrate dynamic free spillage of contrast and has some therapeutic role also.

KEYWORDS : HSG, female infertility, fallopian tubes**Introduction:**

Since ages infertility has affected the human population and has often contributed to many family issues which have changed the shape of mankind through wars and decrees. In present world the age of marriages has increased robbing the couple of nearly decade of fertility years. In addition they also face the burden of work related stress, adulteration of food, inadequate sleep etc which complements this issue of infertility. Infertility has both male and female related causes many of them are treatable. The male related causes can often be subverted by using either selective sperm selection and invitro fertilization techniques or by using sperm donor. Apart from providing the ovum the female is also tasked with growth and nurturing of the fertilized ovum which makes identification and treatment of female causes of infertility even more complex. In both the western and developed nations treatment of infertility carries a lot of ethical and cultural issues.^{1,2} Female infertility can be divided as either primary, that is the female has never become pregnant or secondary which means that she has successfully conceived atleast once and now facing issues with conception.

The various causes of female infertility can be divided as cervical, uterine, tubal, ovarian, peritoneal and central. The tubal causes account for around 30% of all female infertility.³ The various tubal causes include hydrosalpinx, tubal block, salpingitis isthmica nodosum (SIN).

Many congenital uterine anomalies like subseptate uterus, unicornuate uterus with communicating horn etc also contribute to infertility.¹

Due to the variability of uterine shapes and mobility of the tubes assessment of these structures is difficult. Additionally there is need to ensure patency of tubes as test of their function. Routine screening modalities like ultrasound (USG) lack the ability to penetrate the depth needed for visualization of uterus and tubes. Anatomical shape of uterus can be demonstrated by USG with the sensitivity increased using transvaginal scans and 3 D techniques. Despite all this the sensitivity of USG to identify all the mullerian duct anomalies and differentiate between them is low. Ultrasound examination especially transvaginal scans can identify dilatation of the fallopian tube but often differentiation from other adnexal masses becomes difficult and USG cannot comment on the tubal patency.⁴ Pelvic MRI is a newer modality that can identify the mullerian duct anomalies with great

accuracy and also comment on tubal dilatations. However even pelvic MRI cannot provide details on tubal patency or differentiate between communicating and non communicating rudimentary horns or status of the tubal mucosa.⁵ Hysterosalpingogram has the advantage that as it opacifies the endometrial cavity and tubes, it can provide significant comment on the status of the mucosa, patency of the tubes and other mullerian duct anomalies or endometrial/tubal pathologies.⁶ The other advantage is that HSG is postulated to have therapeutic role also where any small debris that is blocking the tubes gets dislodged due to pressure from the installed contrast and the iodinated component in the contrast is also said to have some anti inflammatory properties in non specific tubal infections.^{7,8} The disadvantage is that it is an ionizing modality, slightly invasive and doesnot provide comment on extraluminal problems.

Aim and Objectives:

1. To study the role of hysterosalpingography in female infertility
2. Identify the different pathologies seen on imaging
3. Obtain follow-up wherever possible

Material and Methods:

Type of study: Retrospective and prospective observational study.

Place of study: Fluoroscopy section of Department of Radiodiagnosis in a tertiary care hospital.

Duration of Study: The study was 1 year from August. 2016 to July 2017. At the end of each study the case was followed up for a period of 1 year to assess for any successful conception.

Sample size: 41 patients were selected which presented with history of either primary or secondary infertility.

Inclusion Criteria: Definite history of infertility despite unprotected coitus for more than 1 year.

Exclusion criteria: All patients with bleeding per vaginum or active pelvic inflammatory disease were excluded from the study.

Machine used: 800 mA fluoroscopy machine (Allengers). Five to 10 ml of 350 mg/ml iodinated non ionic monomer was used as contrast media.

Observations and Results:**Table 1: Age-wise distribution of patients**

Age Group (Years)	Number	Percentage
18 – 22	3	7.3
23 – 27	2	4.9
28 – 32	12	21.3
33 – 37	4	9.8
38 - 42	2	4.9
Total	41	100

Table 2: Distribution based on Causes

Causes	Number	Percentage	
Primary Infertility	30	73.2	
Secondary infertility	11	Pure (9)	26.8
		Post TL (2)	

Table 3: Distribution based on pathologies identified

Pathology	Number	Percentage
Tubal block	7	50
Peritubal Adhesions	1	7.1
SIN	1	7.1
Synechia	1	7.1
Submucosal mass	2	14.2
Mullerian duct anomalies	2	14.2
Total	14	100

Table 4: Results based on 1 year followup

HSG result	Conceived	Not conceived
Normal	4	23
Abnormal	2	12

Discussion:

This study comprised of total 41 patients of infertility who underwent HSG as a workup to identify the probable cause of infertility. The study had women from ages ranging from 18 to 42 years with the maximum patients belonging to the age group of 28 to 32 years. Nearly 3 quarters of the patients belonged to primary infertility with rest belonging to secondary infertility. There were 2 cases, which had undergone tubectomy previously and were candidates for recanalization procedures. Amongst the pathologies we identified cases from nearly each cause however the majority of the cases had tubal blocks. Post HSG conception was seen in nearly equal proportions in both normal and abnormal reports.

In many similar studies done in Indian patients tubal blockage was the most common pathology identified.^{8,9} This could be attributed to the high prevalence of genital tuberculosis and other pelvic inflammatory diseases in India. In recently conducted similar study in 2017 in Nigeria it was observed that uterine filling defects like polyps, septae, submucosal fibroids etc were the most common cause followed by tubal occlusion.¹⁰ A lot of research is going on in the field of therapeutic applications of HSG and the recent advance of minimally invasive fallopian tube recanalization (FTR). In our study we did not find any significant difference but in the analysis we had included all abnormal cases and the maximum benefit appears to be in a subclass of tubal blockage. However in view of less number of patients in our study we could not carry out such a subgroup study. Many prior studies have documented the benefit of HSG in further successful conception. And some suggest giving a trial of hydrostatic HSG before opting for minimally invasive modalities like FTR in cases of tubal blockage.^{7,11} To conclude even today HSG is an important tool for evaluation of infertility in females as dynamic imaging is possible, it can identify many mucosal pathologies that are correctable and has a supposed therapeutic role also

Bibliography:

1. S. AM, Ludovico M, Riccardo M. Anatomical causes of female infertility and their management. *Int J Gynecol Obstet* [Internet]. 2013 Sep 11;123(S2):S18–24. Available from: <https://doi.org/10.1016/j.ijgo.2013.09.008>
2. Pennings G. Ethical issues of infertility treatment in developing countries. *ESHRE Monogr* [Internet]. 2008 Jul 1;2008(1):15–20. Available from: <http://dx.doi.org/10.1093/humrep/den142>
3. Thonneau P, Marchand S, Tallec A, Ferial M-L, Ducot B, Lansac J, et al. Incidence and main causes of infertility in a resident population (1 850 000) of three French regions (1988–1989)*. *Hum Reprod* [Internet]. 1991 Jul 1;6(6):811–6. Available from: <http://dx.doi.org/10.1093/oxfordjournals.humrep.a137433>
4. Hillstrom MM. Female Infertility : A Systematic Approach to Radiologic Imaging. 2009;1353–71.

5. Foti PV, Ognibene N, Spadola S, Caltabiano R, Farina R, Palmucci S, et al. Non-neoplastic diseases of the fallopian tube: MR imaging with emphasis on diffusion-weighted imaging. *Insights Imaging* [Internet]. 2016 Jun 18;7(3):311–27. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4877350/>
6. Schankath AC, Fasching N, Urech-Ruh C, Hohl MK, Kubik-Huch RA. Hysterosalpingography in the workup of female infertility: indications, technique and diagnostic findings. *Insights Imaging* [Internet]. 2012 Oct 17;3(5):475–83. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3443271/>
7. Hussain M, Al Damegh S, Tabish A. Therapeutic Efficacy of Hysterosalpingography with Special Reference to Application of Hydrostatic Pressure During the Procedure. *Int J Health Sci (Qassim)* [Internet]. 2007 Jul;1(2):223–7. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3068637/>
8. Poonam. The role of hysterosalpingography in cases of subfertility. *Kathmandu Univ Med J (KUMJ)*. 2007;5(4):456–60.
9. Kumari TM, Swetha A, Sangabathula H. A Study on Role of Hysterosalpingogram (HSG) in Evaluation of Female Infertility. *IJCMSR*. 2017;2(4):164–6.
10. Onwuchekwa CR, Oriji VK. Hysterosalpingographic (HSG) Pattern of Infertility in Women of Reproductive Age. *J Hum Reprod Sci* [Internet]. 2017;10(3):178–84. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC5672723/>
11. Mallarini G, Saba L. Role and application of hysterosalpingography and Fallopian tube recanalization. *Minerva Ginecol*. 2010 Dec;62(6):541–9.