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Vaishali Jain
Consultant, Mahaveer Hospital Department of OBS and Gynae Indore, Madhya Pradesh, India

Dr. Sonal Jain
Deptt of OBS and Gynae Government Autonomus Medical College, Vidisha, Madhya Pradesh, India

Correspondence
Dr. Sonal Jain
Deptt of OBS and Gynae Government Autonomus Medical College, Vidisha, Madhya Pradesh, India

A study on hysterosalpingography findings in patients with infertility

Vaishali Jain and Dr. Sonal Jain

Abstract
Background: Infertility is a complex disorder with significant medical, psychological and economic problems. HSG is a commonly used investigation for evaluation of female genital of tract and the main indication for HSG is infertility.
Aims and objectives: The aim of the study is to evaluate the structural abnormalities of the uterus and tubes in infertility women as elucidated by HSG.
Material and methods: The present study was carried out at Mahaveer Hospital Indore from July 2017 to July 2018 on 90 patients. The biodata and indication for investigation and the HSG findings were obtained. The HSG films were processed on CR system and analyzed with the help of different modalities on computer software including magnification and window setting. Documentation was made and the findings were analyzed.
Results: Majority of patients had primary infertility (57.7%). Most of the patients were in age group of 25 to 30 years (47.7%). 32 patients had abnormal findings in right fallopian tube. Most common abnormality was cornual block (14%).37 patients had abnormal findings in left fallopian tube. Most common abnormality was cornual block (14%).Uterine abnormalities that were detected were filling defect 4 (4.4%), Tshape uterus 4 (4.4%), Arcuate/ Bicornuate uterus 5 (5.5%), Small Infantile uterus 1 (1.1%), Right unicornuate uterus 1 (1.1%), Irregular uterine cavity (Intrauterine adhesions) 1 (1.1%).
Conclusion: HSG is a very effective method to assess tubal status. HSG still plays a significant role in the detection of tubal causes of female infertility.

Keywords: Hysterosalpingography, infertility

Introduction
Infertility is a major global problem and is regarded as a social stigma in the society. It is defined as the inability of a couple to conceive after 12 month of regular unprotected sexual inter course [1]. It is primary if the couples had never been pregnant, whereas secondary is the inability to get pregnant after an earlier pregnancy which may or may not have led to live birth [2]. It is documented that 15% of all women experience primary or secondary infertility at one point in time in their reproductive life [3]. Tubal causes of infertility account for 35-40% causes of infertility. The fallopian tubes are vulnerable to infection and surgical damage which may impair function by affecting the delicate fimbriae or highly specialized endosalpinx. Tubal disease with blockage can involve the proximal (cornual) part, the mid part or distal part. Peritubal adhesions due to infection, inflammation, tuberculosis, endometriosis, previous surgeries and ectopic pregnancy are common factors in tubal sub fertility and need to be assessed.HSG is a common test used to assess fallopian tube patency, morphology of uterus and cervix.It is simple, safe and inexpensive, compared to other methods of evaluation of these structures. It has a sensitivity of 65% and a specificity of 83% in detecting tubal blockage [4]. It has also been suggested that HSG has a therapeutic sole in enhancing sub fertility [5]. By HSG, along with tubal patency and pathology, uterine pathologies like sub mucous fibroid, endometrial polyp, intrauterine synechiae, congenital malformations of uterus and cervical stenosis can also be defected.
Other imaging modalities which play vital role in assessing infertility in females include ultrasound and MRI. Trans vaginal ultrasound scan is a standard first choice procedure, which could be complemented by saline or hysterosalpingo contrast sonography (HyCosy). This has been found to be highly sensitive, specific and accurate in indentifying uterine abnormalities or polyps but has limited value in the assessment of tubal abnormalities. MRI is also limited in its role in fallopian tube assessment but invaluable in evaluating congenital Mullerian duct anomalies and uterine wall lesions. Hysteroscopy and laparoscopy are other complementary but invasive and expensive procedures for fallopian tubes, uterus and cervix evaluation [6].

Aims and objectives

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

Material and methods

The present study was carried out at Mahaveer Hospital Indore from July 2017 to July 2018. The biodata and indication for investigation and the HSG findings of ninety patients were obtained.

Contraindications for the procedure are menstruation, current pelvic infection, a recent dilatation and curettage, endometrial carcinoma, a history of kidney problem or sensitivity to contrast media. Such contraindications were ruled out before performing HSG by taking detailed history of patient.

HSG was performed between days 7 to 10 of cycle. The endometrium is thin during this proliferative phase, a fact that facilitates image interpretation and also ensures that there is no current pregnancy. It is done on OPD basis.

An informed consent was obtained from all patients where in patent was explained in detail about this procedure, a little pain factor during procedure, after effects and after case and benefit of HSG over few negligible side effects. And after all the examination the fallowing variables were analyzed age, type of infertility, patency or blockage of fallopian tubes (and side that is blocked), presence of fibroids, adhesions, and Hydrosalpinx.

Method of performing HSG: The patient was asked to take light lunch 2-3 hours before the procedure. Premedication given was injection atropine and ½ cc of contrast media as test dose about 20 minutes before procedure. Sometimes patients may have cramping pain during HSG. To avoid this, patients were given analgesic drug one hour prior to the procedure. The patient was instructed to empty her bladder before HSG. The patient was placed in supine position on fluoroscopy table in the modified lithotomy position i.e. patient was placed at the foot end of table and asked to flex her knees on abdomen and hold them with her hands. The perineum was cleaned with antiseptic solution. The patient was clinically examined to determine position of uterus and to make sure that there was no pelvic infection. The whole amount of the injected contrast agent was not more than 10 cc. With the help of Sims speculum and vaginal wall retractor, cervix was identified and held with the help of Vulsellum. Again, cervix and adjacent fornices were cleaned by antiseptic solutions. Approximately, 6-7 cc of contrast agent (urograffin 76%) was introduced with the help of a cannula into the uterus and its passage was observed under the fluoroscopy. Acute ante version or retroversion was corrected as far as possible by retracting cervix. Then, first film was obtained on visualization of the uterine cavity. The second film was taken after tubal passage of contrast media and its peritoneal spillage into abdominal cavity or after completion of introduction of 10 cc of contrast agent. The films were processed on CR system and analyzed with the help of different modalities on computer software including magnification and window setting. Documentation was made and the findings were analyzed.

Post-procedural management: The patient was kept strictly in supine position for 30-40 min. and her pulse and blood pressure were monitored for every 5-10 min. up to ½ hour to ensure that she does not have allergic reaction due to contrast. As a routine, patient was given nonsteroidal anti-inflammatory and analgesic tablet, two more doses to be repeated every 4 hours. Also, patient was advised 5 days antibiotics. We asked patient to report immediately if she feels giddy, develops skin rashes or asthmatic attacks.

Complications of HSG: The most common complications are bleeding & infection. The patient was made aware that she may experience light per vaginal spotting after the procedure, usually lasting less than 24 hours. The risk of infection was minimized by exclusive use of sterile instruments. The patients were instructed to watch for the development of fever or foul – smelling vaginal discharge over 2–4 days following HSG and if so, report immediately. The extremely rare complication is a reaction to the contrast media. Such a reaction is very uncommon with the non-ionic contrast agent which we are using presently. The perforation of uterus or fallopian tubes is another extremely infrequent complication which has never occurred at our centers.

Results

Table 1: Type of Infertility

Primary infertility	52 (57.7%)
Secondary infertility	38 (42.2%)
Total	90

Majority of patients had primary infertility. (57.7%)

Table 2: Age Distribution

18-20 YRS	8 (8.8%)
21-24 YRS	26 (28.8%)
25-30 YRS	43 (47.7%)
31-35 YRS	10 (11.1%)
MORE THAN 35 YRS	3 (3.3%)
TOTAL	90

Most of the patients were in age group of 25 to 30 years. (47.7%)

Table 3: Findings in right fallopian tube.

1	Normal	58 (64.4%)
	Abnormal	32 (35%)
2	Cornual block	13 (14%)
3	Hydrosalpinx	5 (5.5%)
4	Fimbrial block	8 (8.8%)
5	Salpingits ishmica nodosa	4 (4.4%)
6	Mid salpingeal block	2 (2.2%)
	TOTAL	90

32 patients had abnormal findings in right fallopian tube. Most common abnormality was cornual block (14%).

Table 4: Findings in Left fallopian tube**.**

1	Normal	53 (58.8%)
	Abnormal	37 (41.1%)
2	Cornual block	13 (14%)
3	Hydrosalpinx	9 (10%)
4	Fimbrial block	6 (6.6%)
5	Salpingits ishmica nodosa	8 (8.8%)
6	Mid salpingeal block	1 (1.1%)
	Total	90

37 patients had abnormal findings in left fallopian tube. Most common abnormality was cornual block (14%).

Table 5: Uterine Abnormalites

1	Normal	74 (82.2%)
	Abnormal	
2	Filling Defect	4 (4.4%)
3	Tshape	4 (4.4%)
4	Arcuate/ Bicornuate	5 (5.5%)
5	Small Infantile uterus	1 (1.1%)
6	Right unicornuate uterus	1 (1.1%)
7	Irregular uterine cavity (intrauterine adhesions)	1 (1.1%)
	TOTAL	90

Uterine abnormalities s that were detected were filling defect 4 (4.4%), Tshape uterus 4 (4.4%), Arcuate/ Bicornuate uterus 5 (5.5%), Small Infantile uterus 1 (1.1%), Right unicornuate uterus 1 (1.1%), Irregular uterine cavity (Intrauterine adhesions) 1 (1.1%).

Discussion

Though there are other advanced and efficient methods of evaluating uterine cavity and Fallopian tubes, HSG is still widely used because it is cheap, readily available and easy interpret. HSG outlines the uterine cavity and fallopian tubes and apart from demonstrating normal patency of the fallopian tubes and their communication with peritoneal cavity, it can also demonstrate congenital abnormalities of the uterine cavity or incompetence of the internal ostium of the cervix which may cause recurrent abortions.

HSG is also used in monitoring of tubal surgical outcomes like it can be used to confirm occlusion of the tubes after sterilization or after surgical intervention to restore patency of pathologically obstructed tubes.

In this study the incidence of primary infertility is more than secondary infertility. It is similar to other studies [7]. In the present study, maximum no. of infertile patients belonged to age group of 25-30 yrs,43 (47.7%) which was comparable with the study done by Malwadde *et al* Dutta *et al.* [8, 9].

Fallopian tube abnormalities are seen in 32(35%) of right tube and 37 (41.5%) of cases of left fallopian tubes. In a similar study by T Radha bhai Prabhu *et al.* [10] tubal defect was reported in 34.6% of cases. Since Lash *et al.* [11] had previously (in 2008) established an association between secondary infertility and fallopian tube occlusion, these results of our study further stress the fact that infection may have been a major underlying cause of infertility among the population studied. The post abortion sepsis and puerperal sepsis lead to tubal defects. This could be because of unavailability or inaccessibility of medical facilities so that many women deliver under poor sanitary conditions or have unsafe abortions and poorly managed spontaneous abortions. Tubal defect can be due to infection mainly due to tuberculosis and sexually transmitted diseases. Previous pelvic surgeries and uterine manipulations such as D & C damage the tubes. Salpingitis Isthmica Nodosa and cornual polyp are rare causes of tubal defect. Pelvic inflammatory disease (PID) is a major reason for tubal sub fertility. PID can damage the tube at multiple sites and also predispose to ectopic pregnancy. The hysterosalpingography has both therapeutic and diagnostic value. Following HSG, certain minor/mild uterine adhesions and partial tubal occlusions are lysed as well as improves patency of fallopian tubes because of flushing of tubes by contrast media [12]. During examination. As a result, infertile women have conceived months after HSG without any other gynaecological intervention. Characteristics of normal HSG – Patency with free spill, preserved distal tubal folds, normal proximal, mid, distal tubal dimensions and appearance, no fimbrial end clumping, no detected peritubal disease, normal tubal pressures with free flow, lack of sharp pain on forceful flushing. Characteristics of sever tubal disease – Patent or blocked tubes, loss of distal tubal folds, altered proximal, mid, distal tubal dimensions and appearance with dilatation/narrowing/scarring/tubal rigidity, fimbrial end dilatation/narrowing with clumping present, peritubal disease may or may not be seen.

Image 1: Normal uterus and tubes with free spillage of dye

Image 2: Right Unicornuate Uterus.

Image 3: Irregular uterine cavity? Intrauterine adhesions

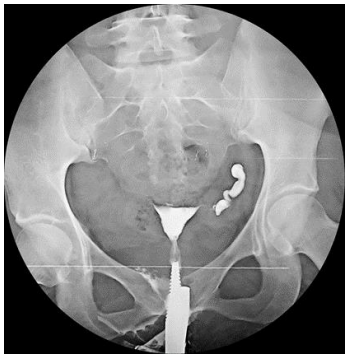

Image 4: Right cornual block Left Hydrosalpinx

Image 5: Bilateral Salinities isthmica nodosa

Conclusion

HSG is a very effective method to assess tubal status. HSG still plays a significant role in the detection of tubal causes of female infertility.

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