Original Article



# Hysterosalpingography in Uterine and Tubal Factor Subfertility - An Outdated Procedure or a Reemergent Study?

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## ABSTRACT

**Objective:** to determine frequency of various abnormalities detected on hysterosalpingography in patients presenting with subfertility.

**Study Design:** Descriptive / cross-sectional study

**Place and Duration of Study:** This study was conducted at the Department of Obstet. and Gynae, Noshera Medical College, Noshera. from October 2013 to March 2014.

**Materials and Methods:** This study involved 318 patients presenting to outpatient Gynae clinic of Northwest General Hospital and Research Hospital, Peshawar with primary or secondary infertility of at least one year. After initial history, examination and consent, HSG was performed using set criteria and the films reported by consultant radiologist.

**Results:** Mean age of the patients was 29.6 years with 25-36 years being the commonest age group. 58.5% patients had primary infertility whereas 41.5% patients had secondary infertility. Majority of the patients (84%) had normal HSG whereas only 16% showed some abnormality. The abnormalities detected on HSG included Tubal block ( 13.8%...unilateral:9.4%%; bilateral:4.4%), Hydrosalpinx (2.5%....unilateral:2.5%; bilateral:0.6%), Peritubal adhessions(1.6%) and uterine abnormalities (2.8%). The most frequent uterine abnormality was bicornuate uterus (1.6%) which was more common in primary infertility patients, followed by submucous fibroid/ polyp (0.6%). Proximal tubal block was more common than distal tubal block.

**Conclusion:** The majority of patients in this study had normal HSG and most of these can be spared laparoscopy, given the high specificity of HSG for tubal patency. Therefore, HSG is still the 1st line investigation in the workup of tubal factor for infertility.


**Key Words:** Infertility, Hysterosalpingography, tubal block.

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## INTRODUCTION

The desire to procreate is intrinsic to every woman. Inability to do so leads to unimaginable physical, psychological, economic and social distress.[1,2,3] Infertility is defined as the inability of a couple to conceive following 12 months or more of regular unprotected intercourse. [4,5,6] According to WHO, 1 in every 4 couples in developing countries are are affected by infertility.[7] However, it s incidence ranges from 6.6-32.6%[8], depending on the duration of infertility used in definition and the population studied, e.g., community or hospital clinics.[9]

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The causes of infertility include anovulation (20%), tubal factor (11-30%), male factor (20-30%).[10] Initial workup of infertile couple should include Semen analysis (analysis of male factor), transvaginal ultrasound scan (pelvic anatomy), follicular phase gonadotrophins and mid-luteal progesterone (ovarian reserve and ovulation).[11,12]

Routine tubal patency testing, being invasive, is debatable in the infertility workup.[12] It should be offered after after taking into account the overall treatment needs of the couple. The most commonly used tests of tubal patency include Hysterosalpingography (HSG), Laparoscopy and Dye test and Hysterocontrast sono-salpingography. [13,14]Other less commonly used tests include Selective Salpingography and tubal catheterization,transvaginal hydrolaparoscopy, fertiloscopy, salpingoscopy, falloposcopy and chlamydia antibody testing.[15,16,18,19]

Laparoscopy is widely considered to be the gold-standard for assessing tubal patency, as it enables direct visualization of pelvis and allows treatment of mild endometriosis and periadnexal adhesions.[20] However, it is more invasive, requires general anesthesia and carries risk of injury to abdominal organs.[21] In contrast, HSG being cheap, widely available, less invasive and an outpatient procedure, can be regarded as a better 1st line investigation for assessing tubal patency. It has a high specificity of 83%, making it a better test for

identification of tubal patency. Its limitations include failed catheterization or instrumentation., and false positives ( sensitivity 65%) due to tubal spasm or debris.[22,23,24]

HSG is a several decades old investigation now. The improvements in radiology/ fluoroscopic services, in addition to the advent of several new techniques for assessing tubal pathology has necessitated the need to re-appraise its role in the current era of ART. This study was conducted with the aim to evaluate its role in this context.

# MATERIALS AND METHODS

This descriptive study was carried out at Northwest General Hospital and Research Center, Peshawar from October 2013 to March 2014. The subjects were 318 patients, selected by non-purposive convenience sampling, presenting to outpatient Gynae clinic, with primary or secondary subfertility of at least 1 year. Those patients whose husbands were abroad for the last one year or had abnormal semen parameters were excluded from the study. The procedure and purpose of the study was explained to the subjects and informed consent was taken. Subjects were given an intramuscular injection of Diclofenac Sodium 15 minutes before the procedure. With patient in dorsal position, uterine size and position were assessed first digitally and then with uterine sound. After introducing Cuscos speculum and holding anterior cervical lip with tenaculum, size 8 F catheter was introduced through cervix and retained. In Radiology department, 10-20 ml of radio-opaque dye (Urograffin) was introduced through the catheter under fluoroscopic control and X-ray films taken. Antibiotic prophylaxis was given to all patients after the procedure.the findings on HSG films were reported by consultant radiologist.

All the relevant data was entered on to a proforma and analysed using SPSS 20. Results were presented as graphs and tables.

# RESULTS

This study involves 318 patients presenting with infertility. The ages of the patients ranged from 17-45 years. Mean age was 29.64+/_5.32 SD. The results are tabulated as below:

**Table No.1: Age Groups**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | < 20 yrs | 9 | 2.8 | 2.8 | 2.8 |
| | 20-25 | 67 | 21.1 | 21.1 | 23.9 |
| | 26-30 | 113 | 35.5 | 35.5 | 59.4 |
| | 31-35 | 77 | 24.2 | 24.2 | 83.6 |
| | 36-40 | 46 | 14.5 | 14.5 | 98.1 |
| | > 40 | 6 | 1.9 | 1.9 | 100.0 |
| | Total | 318 | 100.0 | 100.0 | |

**Table No.2: Type of Infertility**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | primary | 186 | 58.5 | 58.5 | 58.5 |
| | secondary | 132 | 41.5 | 41.5 | 100.0 |
| | Total | 318 | 100.0 | 100.0 | |

**Table No.3: HSG findings**

| | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|
| Normal | 267 | 84.0 | 84.0 | 84.0 |
| Abnormal | 51 | 16.0 | 16.0 | 100.0 |
| Total | 318 | 100.0 | 100.0 | |

**Table No.4: Tubal Block Laterality**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 0 | 274 | 86.2 | 86.2 | 86.2 |
| | unilateral | 30 | 9.4 | 9.4 | 95.6 |
| | bilateral | 14 | 4.4 | 4.4 | 100.0 |
| | Total | 318 | 100.0 | 100.0 | |

**Table No.5 :Hydrosalpinx**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 0 | 310 | 97.5 | 97.5 | 97.5 |
| | unilateral | 6 | 1.9 | 1.9 | 99.4 |
| | bilateral | 2 | .6 | .6 | 100.0 |
| | Total | 318 | 100.0 | 100.0 | |

**Table No.6: Peritubal Adhesion**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 0 | 313 | 98.4 | 98.4 | 98.4 |
| | 1 | 5 | 1.6 | 1.6 | 100.0 |
| | Total | 318 | 100.0 | 100.0 | |

**Table No.7: Uterine Abnormalities**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 0 | 309 | 97.2 | 97.2 | 97.2 |
| | uterus didelphys | 1 | .3 | .3 | 97.5 |
| | bicornuate uterus | 5 | 1.6 | 1.6 | 99.1 |
| | infantile uterus | 1 | .3 | .3 | 99.4 |
| | submucous fibroid/polyp | 2 | .6 | .6 | 100.0 |
| | Total | 318 | 100.0 | 100.0 | |

**Table No.8:Tubal Block Site**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 0 | 274 | 86.2 | 86.2 | 86.2 |
| | proximal | 26 | 8.2 | 8.2 | 94.3 |
| | distal | 18 | 5.7 | 5.7 | 100.0 |
| | Total | 318 | 100.0 | 100.0 | |

# DISCUSSION

This study involves 318 women presenting with subfertility. Most of the patients (35.5%) were in the age group / of 26-30 years. This is in accordance with studies conducted in other developing and under-developed countries,[25] where early marriage and child bearing is a norm, but in contrast to studies in the developed world[26] where there is trend to delaying marriage and child birth, hence infertile couple present later in age.

In this study, Primary infertility was the major type of infertility, comprising of 58.5% of patients whereas 41.5% of patients presented with secondary infertility. Studies on infertility have shown a similar trend in that secondary infertility ,although less frequent than primary infertility , is on the rise.[7, 27]This is probably due to increasing rates of caesarian sections and Pelvic inflammatory disease, resulting in tubal block and also due to increasing age of patients and prolonged birth-spacing resulting in diminishing ovarian reserve with time.

Regarding HSG findings, 84% of subjects had normal HSG findings whereas 16% had one or more abnormal findings on HSG. Studies on HSG conducted so far report wide variations in the proportions of abnormal HSG. [25,26,27]This depends on whether patients have been referred after initial workup elsewhere and also on the prevalence of PID in that set-up; both situations leading to increased rates of abnormal HSG as much as 50%.In our study, the yield of HSG was low (only 16% abnormal HSG).This could be either because the indication was too broad or there was a selection bias in that those who were considered to have pelvic pathology like PID, endometriosis, adhesions were directly referred for laparoscopy.[26]

The commonest abnormality detected on HSG was Tubal block (13.8%.....unilateral:9.4%; bilateral: 4.4%). Similar results were obtained in a study conducted in Oman by Subhi et al. [28] Hydrosalpinx accounted for 2.5% cases, out of which unilateral were 1.9% and bilateral were 0.6%. The diagnosis of hydrosalpinx is significant in that preventive salpingectomy is recommended in such patients prior to IVF to improve implantation rates.[29]

Peritubal adhesions, detected by convoluted fallopian tubes and/or loculation of spillage of contrast medium in the peritoneal cavity,[30] were seen in 1.6% patients. Although HSG can detect peritubal adhesions in upto 75% cases, [30] laparoscopy is the gold-standard for their diagnosis and HsG should not be used for this purpose[22].

Uterine abnormalities were detected in2.8% patients. The most frequent uterine abnormality was bicornuate uterus( 1.6%) which was more common in primary infertility patients, followed by submucous fibroid/ polyp(0.6%) which was more common in secondary infertility patients. Abnormalities in the uterine cavity detected on HSG should be further evaluated by hysteroscopy.

Determination of tubal block site is important as it can help us in choosing the type and determining prognosis of tubal reconstructive surgery. [31]In this study, 8.2% of patients had proximal tubal block as evident by the lack of tubal filling on HSG whereas 5.7% of patients had distal tubal block in which the tube was outlined however there was no spill of the dye. A similar result was obtained by a study conducted in Nepal by Poonam.[27]

In this study, majority of patients (84%) had normal HSG. Studies have revealed that , in infertile couples having normal HSG, there is a four-fold increase in pregnancy rate during first three months after HSG and, although not by the same proportion, but the trend remains so up to one year after HSG.it is in this subset of patients who can be spared initially from invasive investigations like laparoscopy and hysteroscopy. Only those patients can be referred for laparoscopy who fail to conceive within 3-12 months of HSG. After 12 months, there is no difference in the rate of pregnancy among those who had and and those who didn't have HSG. By following such criteria for laparoscopy, the chance of finding a pelvic pathology, and/or the need for change in treatment plan after laparoscopy is increased, hence making it more cost effective. Thus, HSG can not only short-list patients for laparoscopy, [32]it may have a therapeutic effect on the remaining patients. [33].

# CONCLUSION

HSG is a valuable initial investigation in the work up of infertility, even in the modern era of ART. It is fairly reliable in establishing patency of tubes. However, the small minority of patients with blocked tubes or intra-cavitary pathology need to be evaluated further by hysterosalpingography and hysteroscopy respectively..

**Conflict of Interest:** The study has no conflict of interest to declare by any author.

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