

# Hysterosalpingography Findings among Women Presenting for Infertility Evaluation

MADEEHA RIAZ<sup>1</sup>, SADIA FAIZ<sup>2</sup>, RUBIA FATIMA<sup>3</sup>, KHADIJA SATTAR<sup>4</sup>, ZIA UL ISLAM<sup>5</sup>, ATQA FIRDOUS<sup>6</sup>, MM KHAN<sup>7</sup>

<sup>1</sup>Senior Registrar Ward No.17 Nishtar Hospital Multan

<sup>2</sup>Consultant Gynecologist, Ward No.17 Nishtar Hospital Multan

<sup>3</sup>Senior Registrar Ward No.17 Nishtar Hospital Multan

<sup>4</sup>Senior Registrar, Ward No. 16 Nishtar Hospital Multan

<sup>5</sup>Assistant Professor Radiology MM&DC Multan

<sup>6</sup>Assistant Professor Radiology MM&DC Multan

<sup>7</sup>Professor Community Medicine NM&DC

Correspondence to: Dr. Khadija Sattar, Email: [Khadija\\_sattar@hotmail.com](mailto:Khadija_sattar@hotmail.com), Cell: 03216335544

## ABSTRACT

**Objective:** To determine the pattern of hysterosalpingography (HSG) findings among women presenting with infertility.

**Methods:** From June 2021 to March 2022, this study included 100 women who visited the Nishtar hospital's infertility clinic. All these patients underwent HSG evaluation. The HSG examination was planned to take place between the seventh and twelfth day of the patient's menstrual cycle, and before the patient had any sexual activity. Patients were instructed to take a nonsteroidal anti-inflammatory medication such as 400 milligrams of ibuprofen half an hour before their hysterosalpingograms as a preparation for the possibility that they may experience some level of discomfort during the procedure. HSG findings were noted for each patient.

**Results:** The mean of participants was 32.5±1.2 years. Mean infertility duration was 5.5±4.3 years. On hysterosalpingography examination, right fallopian tube occlusion was found in 7% patients, left in 13% and bilateral in 25% patients. Hydrosalpinx was diagnosed in right fallopian tube in 7.0% patients, in left in 5% patients and in both fallopian tubes in 3% patients. Overhanging tubes were diagnosed in 8% patients and beaded tubes in 1.0% patients. Regarding uterine pathologies, fibroids were diagnosed in 21% patients, and synaechiae in 8% patients. Regarding cervical pathologies, irregular pattern was found in 2% patients, patulous in 2% and in stenosis in 1.0% patients.

**Conclusion:** Hysterosalpingogram, an essential instrument in the evaluation of infertility, plays a significant part in identifying illnesses that affect the female reproductive system. According to the findings of this study, tubal diseases are the leading cause of female infertility.

**Keywords:** Infertility, Tubal abnormalities, Hysterosalpingogram

## INTRODUCTION

Infertility is not being able to get pregnant after 12 months of regular, unprotected sexual activity, or not being able to get pregnant because of a problem with a person's ability to have children on their own or with a partner.<sup>1</sup> Infertility affects between 9 and 18% of the general population. It affects about 15% of couples of reproductive age.<sup>2</sup> It is called "primary" if the couple has never gotten pregnant, and "secondary" if the couple has been pregnant before, even if it wasn't a live birth.<sup>3</sup>

The factors that can lead to infertility have been divided into two categories: those that affect men, such as low semen parameters, and those that affect women, such as uterine abnormalities, obstructed fallopian tubes, or anovulation. Male infertility is more common.<sup>4</sup>

A radiographic method called hysterosalpingography (HSG) uses contrast material to define the female reproductive canal. Despite improvements in gynecological imaging in the west, HSG remains a crucial examination in assessing the female genital tract, especially in the initial diagnostic workup of female infertility in the majority of developing nations.<sup>5,6</sup>

In addition, HSG plays a part in the evaluation of the uterine cavity and the cervix. This is important because abnormalities in the uterine cavity might be a contributing factor in infertility in women. There have been reports of abnormal uterine findings in as many as fifty percent of women who have experienced repeated implantation failure.<sup>7</sup> On an HSG, these findings may include the presence of endometrial polyps or fibroids, which can be identified as filling defects or abnormalities in the uterine wall. HSG is also able to demonstrate the presence of intrauterine adhesions and congenital abnormalities. This study's objectives were to analyze all pathologies that were identified by HSG in gynecologic patients treated at our center and to determine the prevalence of such illnesses.

## METHODOLOGY

From June 2021 to March 2022, this study included 100 women who visited the Nishtar hospital's infertility clinic. To be considered

for inclusion, each patient's medical history was thoroughly reviewed, with particular attention paid to the patient's age, infertility type, regularity of menstrual cycle, history of pelvic inflammatory disease (PID), tubal obstruction or dysfunction, and the partner's seminal tests. Patients were not allowed to participate in the trial if they had lower genital tract infections, active PID, active uterine or vaginal hemorrhage, or severe allergies to iodine-based contrast agents.

The examinations were carried out by qualified radiologists, and the documentation was compiled by radiologists with extensive clinical experience. After the patients had arrived at the x-ray department, the procedure and any potential risks associated with it were discussed with them, and informed consent was sought from each individual patient. The HSG procedure was carried out exactly as was explained earlier (Onwuchekwa and Oriji, 2017). The HSG examination was planned to take place between the seventh and twelfth day of the patient's menstrual cycle, and before the patient had any sexual activity. This was done to ensure that the patient would have a thin endometrium, which would make it easier to interpret the images, and to rule out the possibility of pregnancy, which is an absolute contraindication for the HSG examination. It was recommended that certain patients get pregnancy tests since their menstrual cycles were erratic, which increased the likelihood that they were pregnant. Patients were instructed to take a nonsteroidal anti-inflammatory medication such as 400 milligrams of ibuprofen half an hour before their hysterosalpingograms as a preparation for the possibility that they may experience some level of discomfort during the procedure.

After administering a local anesthetic, a vaginal speculum was introduced into each patient while they were positioned in the lithotomy position at the foot end of the table. The procedure was performed utilizing aseptic technique. After that, a uterine sound was passed to evaluate the uterine size as well as direction. After removing any excess air from the cannula, a syringe containing 15 milliliters of urografin concentrated at 60% was affixed to the tip of the cannula. The cannula was then inserted and secured to the

cervix before the patient was raised up the table. This was done by applying a light amount of traction with vulsellum forceps. The patient's position was modified, and then contrast was slowly administered while being monitored by fluoroscopy. Approximately 5 milliliters of contrast were injected to show the uterine cavity, and another 5 milliliters were injected to show free leakage into the peritoneal cavity. Films were then shot with the patient supine position. Both of these injections were performed after the patient was placed in the supine position. The patient has access to normal saline as well as medications that could save their life. In this study, the only discomfort associated with the HSG procedure was minimal. There were no complications. Patients were warned that they may experience vaginal bleeding for one to two days after the operation. Antibiotics were required for some of the patients and were prescribed to them.

We used a questionnaire that had been carefully put together. With the help of the SPSS, a descriptive statistical data analysis was carried out, which took into account patient information as well as clinical history and radiological findings. The categorical clinical and procedural data pertaining to the patients were reported as frequencies and percentages respectively.

**RESULTS**

The mean of participants was 32.5±1.2 years. Mean infertility duration was 5.5±4.3 years. Out of 100, 65% patients were having 0 parity, 26% 1 and 9% were having ≥2. Type of infertility was primary in 20% participants and was secondary in 80% participants (Table 1).

On hysterosalpingography examination, right fallopian tube occlusion was found in 7% patients, left in 13% and bilateral in 25% patients. Hydrosalpinx was diagnosed in right fallopian tube in 7.0% patients, in left in 5% patients and in both fallopian tubes in 3% patients. Overhanging tubes were diagnosed in 8% patients and beaded tubes in 1.0% patients. Regarding uterine pathologies, fibroids were diagnosed in 21% patients, synaechiae in 8% patients, congenital anomalies in 3.0% patients and adenomyosis in 1.0% patients. Regarding cervical pathologies, irregular pattern was found in 2% patients, patulous in 2% and in stenosis in 1.0% patients (Table 2).

Table 1. Baseline Characteristics.

Mean Age (Y)	32.5±1.2
Infertility Duration (Y)	5.5±4.3
<i>Parity</i>	
0	65 (65%)
1	26 (26%)
≥2	9 (09%)
<i>Infertility Type</i>	
Primary	20 (20%)
Secondary	80 (80%)

Table 2. Hysterosalpingography findings.

<i>Fallopian Tube Pathologies</i>	
<b>OCCLUSION</b>	
Right	7 (7%)
Left	13 (13%)
Bilateral	25 (25%)
<i>HYDROSALPINX</i>	
Right	7 (7.0%)
Left	5 (5.0%)
Bilateral	3 (3.0%)
<b>OVERHANGING TUBES</b>	
	8 (8.0%)
<b>BEADED TUBE</b>	
	1 (1.0%)
<i>UTERINE PATHOLOGIES</i>	
Fibroids	21 (21.0%)
Synaechiae	8 (8.0%)
Congenital Anomaly	3 (3.0%)
Adenomyosis	1 (1.0%)
<i>CERVICAL PATHOLOGIES</i>	
Irregular	2 (2.0%)
Patulous	2 (2.0%)
Stenosis	1 (1.0%)

**DISCUSSION**

One in every seven couples struggles with infertility.<sup>8</sup> Consequently, it impacts a large percentage of the population and has a substantial impact on the overall economy. There is still a need for more study on how to diagnose and treat infertility in underdeveloped nations, where the problem is most acute.<sup>9</sup>

The hysterosalpingogram is still widely used despite the fact that there are other more advanced and effective methods of evaluating the uterine cavity and fallopian tubes in women who present with infertility. This is because the hysterosalpingogram is inexpensive, readily available, and simple to interpret. It is noninvasive and less expensive than other methods, and it discloses any abnormalities in the cervix, uterus, or fallopian tubes. It is easily accessible and is typically the initial step in the imaging evaluation of the fallopian tubes in cases of infertility, particularly in underdeveloped nations like our own.<sup>10</sup>

The results of this study indicate that the average age is 32.50 years, and it also demonstrated that the majority of infertile women who presented themselves for HSG were between the ages of 30 and 34 years old. This should not come as a surprise given that we have reached the pinnacle of the female reproduction stage. Previous research found that the mean age was very consistent.<sup>11,12</sup> Because of improvements in educational opportunities for women, the majority of the women in our community were married between the ages of 24 and 30. Because the initial course of action is typically devoted to religious activities and prayers, if pregnancy is not accomplished after marriage, there is a greater delay in presenting for medical evaluation. This is due to the fact that the first line of action was previously stated. However, after a few years of trying to be patient but not succeeding, an increased desire to become pregnant, and in some cases, the increased burden of domestic violence from the spouse and in-laws, as she is assumed to be the cause of the problem, leads to submission to medical consultation and investigations. Ultimately, this results in the woman submitting to medical consultation and investigations.<sup>13</sup>

It was found that bilateral tubal obstruction occurred in 11.2% of patients. This is a lower percentage than the 18.7 percent that was recorded in Nnewi, but it is higher than the 4% that was previously reported in Port Harcourt and the 4.5 percent that was reported in Sokoto.<sup>11</sup> The prevalence of bilateral tubal pathology was found to range anywhere from 9 to 21%, according to the findings of Broeze et al., who conducted a meta-analysis of seven separate studies that focused on the hysterosalpingography diagnosis of tubal disorders. The incidence of tubal obstruction was observed to be significantly higher in the right (8.8%) of patients than in the left (7.6%) of instances.<sup>14</sup> Previous studies also identified a large rate of right fallopian tube involvement, which they attributed to prior appendectomy and the accompanying surgical repercussions of that procedure. On the other hand, we did not collect any information regarding postoperative problems for this test. The most common type of tubal obstruction was called distal fallopian tube occlusion, and it was rather common. Previous study has proven that infections are the primary cause of infertility in our environment. This restriction is often the result of earlier pelvic infections and adhesions.<sup>15,16</sup>

According to this research, secondary infertility, which accounts for 80% of cases, is more common than original infertility, which accounts for 20% of cases. Previous studies came to similar conclusions after making observations.<sup>17</sup> In contrast to our findings, other research has found that primary infertility is the most common reason for infertile women to undergo hysterosalpingography.<sup>18</sup>

In agreement with the findings of prior investigations, the majority of uterine diseases that were observed were fibroids in the uterine lining.<sup>19,20</sup> It has been found that women who have many uterine fibroids typically require a greater volume of contrast material to be administered during HSG procedures. This may not be unrelated to the fact that their uterus is typically larger than average. On an HSG, the aberrant uterine cavity outlines and filling

deficiencies caused by fibroid nodules can be seen. In this particular investigation, there was a three percent incidence of hysterosalpingograms that revealed congenital uterine abnormalities. The arcuate uterus was by far the most prevalent form of congenital abnormality that was observed. Other less common HSG abnormalities that were found in this study included two cases of what was thought to be adenomyosis, which appeared as irregular branching outpouchings of contrast radiating from the uterine cavity. These outpouchings were thought to represent extension of the endometrial glands into the myometrium.<sup>21</sup> It was discovered that one patient had a beaded appearance of the fallopian tube, which was consistent with salpingitis isthmica nodosa. These findings are comparable to those of Akinola et al.<sup>22</sup>

## CONCLUSION

Hysterosalpingogram, an essential instrument in the evaluation of infertility, plays a significant part in identifying illnesses that affect the female reproductive system. According to the findings of this study, tubal diseases are the leading cause of female infertility.

## REFERENCES

- Zegers-Hochschild F, Adamson GD, Dyer S, Racowsky C, de Mouzon J, Sokol R, et al. The international glossary on infertility and fertility care, 2017. *Fertil Steril*. 2017;108(3):393-406.
- Aghajanova L, Hoffman J, Mok-Lin E, Herndon CN. Obstetrics and gynecology residency and fertility needs. *Reprod Sci*. 2017;24(3):428-34.
- Subedi S, Lamichhane S, Chhetry M. Study of Infertile Couples Attending a Teaching Hospital in Eastern Nepal. *JNMA J Nepal Med Assoc*. 2016;55(203):22-5.
- Panti AA, Sununu YT. The profile of infertility in a teaching Hospital in North West Nigeria. *Sahel Med J*. 2014;17(1):7.
- Omidiji OA, Toyobo OO, Adegbola O, Fatade A, Olowoyeye OA. Hysterosalpingographic findings in infertility - what has changed over the years? *Afr Health Sci*. 2019;19(2):1866-1874.
- Onwuchekwa CR, Oriji VK. Hysterosalpingographic (HSG) Pattern of Infertility in Women of Reproductive Age. *J Hum Reprod Sci*. 2017;10(3):178-84.
- Inal ZO, Inal HA, Altunkeser A, Alkan E, Arslan FZ. Hysterosalpingographic Findings of Infertile Patients Presenting to Our Reproductive Endocrinology Department: Analysis of 1,996 Cases. *Curr Med Imaging Rev*. 2019;15(8):777-784.
- Thurston L, Abbara A, Dhillon WS. Investigation and management of subfertility. *J Clin Pathol*. 2019;72(9):579-87.
- Gerrits T, Van Rooij F, Esho T, Ndegwa W, Goossens J, Bilajbegovic A, et al. Infertility in the Global South: Raising awareness and generating insights for policy and practice. *Facts Views Vis Obgyn*. 2017;9(1):39-44.
- Toufig H, Benameur T, Twfieq ME, Omer H, El-Musharaf T. Evaluation of hysterosalpingographic findings among patients presenting with infertility. *Saudi J Biol Sci*. 2020;27(11):2876-82.
- Danfulani M, Mohammed MS, Ahmed SS, Haruna YG. Hysterosalpingographic findings in women with infertility in Sokoto North Western Nigeria. *Afr J Med Health Sci* 2014;13(1):19-23.
- Okafor CO, Okafor CI, Okpala OC, Umeh E. The pattern of hysterosalpingographic findings in women being investigated for infertility in Nnewi, Nigeria. *Niger J Clin Pract*. 2010;13(2):264-7.
- Balen VF. Interpreting infertility; social science research on childlessness in a global perspective, Amsterdam. *Afr J Reprod Health* 2000;4:120-2.
- Broeze KA, Opmeer BC, Van Geloven N, Coppus SF, Collins JA, Den Hartog JE, et al. Are patient characteristics associated with the accuracy of hysterosalpingography in diagnosing tubal pathology? An individual patient data meta-analysis. *Hum Reprod Update*. 2011;17(3):293-300.
- Case AM, Pierson RA. Clinical use of sonohysterography in the evaluation of infertility. *J Obstet Gynaecol Can* 2003; 25:641-8.
- Pham C, Torre A, Mol B. Cost-effectiveness modelling of three different hysterosalpingography diagnostic strategies in addition to standard fertility management for couples with unexplained infertility in the United Kingdom. *Hum Fertil (Camb)*. 2021;4:1-10.
- Onwuchekwa CR, Oriji VK. Hysterosalpingographic (HSG) pattern of infertility in women of reproductive age. *J Hum Reprod Sci* 2017;10:178-84.
- Nwankwo NC, Akani CI. Pattern of hysterosalpingographic findings in infertility in Port Harcourt. *West Afr J Radiol* 2005;12(1):15-9.
- Kiridi E, Ibrahim I, Lawani L. Hysterosalpingography: Still relevant in the evaluation of infertility in the Niger Delta. *International Journal of Medicine and Biomedical Research*. 2015;4(1):50-4.
- Mgbor S. Pattern of Hysterosalpingographic findings in gynaecological patients in Enugu. *Nig Med J*. 2006;47:14-6.
- Maheshwari A, Hamilton M, Bhattacharya S. Effect of female age on the diagnostic categories of infertility. *Human Reprod*. 2008;23(3):538-42.
- Akinola R, Akinola O, Fabamwo A. Infertility in women: Hysterosalpingographic assessment of the fallopian tubes in Lagos, Nigeria. *Edu Res Rev*. 2009;4(3):86.