



Evaluation of Abnormalities in Female Reproductive System with the Help of Hsg- Systematic Review Study

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KEYWORDS

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ABSTRACT:

Background and Purpose: The main purpose of this study is to evaluate the uterus and fallopian tubes and to assess uterine and tubal abnormalities identified by radiographic HSG and comprehend their possible significance as infertility causes.

Conclusion/Discussion: HSG tests showed that tubal obstruction, which may complicate PID and abdomino-pelvic surgeries, was the most prevalent abnormality. HSG is simple, safe, and affordable; it is an essential tool for evaluating infertile females. According to this study, tubal block was the most frequently identified structural cause of infertility in females. The most frequent finding among patients who had an HSG examination, according to this study, was pelvic adhesion.

1. Introduction

A diagnostic radiologic technique called Hysterosalpingography (HSG) is used to assess anomalies in the female reproductive system, specifically the uterus and fallopian tubes. This process is essential for determining the composition and functionality of these reproductive organs, which helps with the diagnosis of a number of gynaecological disorders and problems related to infertility. Two common indications for obtaining an HSG are evaluation of tubal patency as part of an infertility workup and of congenital uterine anomalies.¹

HSG Protocol: Usually, a radiology department or specialty clinic will conduct HSG. It entails injecting dye, or a contrast medium, through the cervix into the uterus. On X-ray images, the contrast medium makes the uterus and fallopian tubes visible.²

Goals of HSG:

Evaluating Uterine Abnormalities: Congenital anomalies, fibroids, polyps, adhesions (Asherman's syndrome), and other uterine structural abnormalities can all be found with HSG. Menstruation and fertility may be impacted by these problems.³
Evaluation of the Fallopian Tubes: HSG is especially helpful in determining the patency, or openness, of the fallopian tubes. Infertility can result from blocked or damaged tubes that prevent eggs from passing from the ovaries to the uterus and fertilization.⁴
Examining Recurrent Miscarriages: By analyzing the uterine cavity and looking for anomalies that could affect pregnancy, HSG can assist in determining possible causes of recurrent miscarriages.
Fertility Assessment: This procedure can identify potential blockages, anomalies, or other factors affecting the reproductive system, which can provide couples facing infertility important information.⁵



Assessing the female genitalia when a woman is infertile.⁶

PATHOLOGY

1. Uterine didelphys with distal tubal block and terminal hydrosalpinx
2. Bicornuate uterus with bilateral intra-peritoneal spillage.
3. Bilateral proximal tubal block
4. Infertility.⁷

2. Methods:

A survey of the literature served as the foundation for this retrospective investigation. Several recommended search engines, such as PubMed, Google Scholar, Scopus, and Web of Science

3. Discussion

A survey of the literature served as the foundation for this retrospective investigation, several recommended search engines, such as PubMed, Google Scholar, Scopus, and Web of Science were used to analyse the literature which were published in between the year 2010 to 2023. This allowed for the inclusion of pertinent 20 articles from all the reliable publications. As per Thurston et al. (2019), infertility impacts one out of every seven pairs. As such, a sizable portion of the population is impacted, adding to the overall burden. Where the burden of infertility is highest, in developing nations, more research is needed to integrate and implement infertility diagnosis and treatment (Fathalla, 2019). In addition, the reasons behind infertility differ depending on the features of the community. Deeshpande and Gupta (2019) state that it is crucial to research local causes of infertility and adjust practices accordingly. Hysterosalpingography is one of the first line imaging techniques used in the work up of infertility, even though it has been around for more than a century (Omidiji et al., 2019). Though there are other complementary methods, it is still widely used because it is readily available, affordable, less invasive, and easily interpretable (Onwuchekwa and Orij, 2017).⁸ When the isthmus is at its most distensible and the fallopian tubes are most readily filled with contrast medium, around the end of the first week following the menstrual cycle is the best time to undergo HSG. Because of the potential to unintentionally expose an on-going pregnancy to radiation and the increased risk of venous extravasation due to thicker secretory endometrium, which could result in a false positive

diagnostic of corneal occlusion, HSG is avoided in the second half of the cycle. This review's primary indication for HSG was secondary infertility, which is consistent with other research. The percentage of films demonstrating anomalies (70.6%) is similar to the percentages reported from Enugu and Ile Ife. Given its great sensitivity in detecting abnormalities related to the uterus and tubules, HSG is a valuable diagnostic tool for uterine and tubal conditions in our setting. Radiologic examinations are useful non-operative procedures for the diagnosis of uterine and tubal pathology, even though laparoscopy and dye tests offer more information than HSG. But according to recent research, Sonohysterography is a better method for evaluating intrauterine anomalies than high-sensitivity gestational mapping (HSG).¹

When evaluating the uterine cavity, tubal patency, and tubal disease in female fertility investigations, high-sensitivity sonography (HSG) has proven to be a valuable and initial diagnostic tool. The outcomes of HSG also have a big impact on management that comes after. It is noteworthy that HSG analysis and performance are not limited to reproductive specialists. Radiologists conduct and interpret the test frequently. The degree of variation in radiologists' interpretations of this test when compared to clinicians is unknown. The interpretation of radiologists and clinicians for identifying anomalies on HSG films was the subject of only one study in the literature. Additionally, the observers' compatibility or degree of agreement when reading the films was assessed. Following that, the answers of the two groups were further compared for consistency and variation. According to Renbaum et al., there was a high level of inter-reader reliability in identifying uterine filling defects, normal tubal patency, and normal uterine contour, but a lower level in identifying hydrosalpinx. They discovered that inter-reader reliability was lower for the identification of a hydrosalpinx and higher for the detection of uterine filling defects, normal tubal patency, and normal uterine contour. Comparably, in our study, the inter-observer reliability was low for uterine contour and hydrosalpinx detection and high for uterine anomaly, contrast passage to the peritoneal cavity, uterine deviation, and uterine filling defect within clinicians. Nonetheless, radiologists generally had higher inter-observer reliability than clinicians, and they also demonstrated greater consistency.⁹



The readings reported in literature for a normal uterus, uterine anomaly, and normal tubes showed the strongest agreements. Comparing radiologists' and clinicians' readings was the third objective of the research. The findings of our study demonstrated that radiologists were more compatible than clinicians when it came to HSG interpretation. Compared to radiologists' reports, fewer patients had normal uterine cavity contours, and there was a statistically significant disparity between the interpretations ($p < 0.0001$), 14% vs. 47%. Furthermore, radiologists had significantly higher rates of uterine deviation (70% vs. 22%, $p < 0.0001$) when compared to clinicians. Clinicians reported a statistically significant difference in the proportion of patients with uterine filling defects (10% vs. 22%, $p = 0.0207$) when compared to radiologists. Evaluations of uterine anomalies and tubes were typically comparable. It could be because uterine anomalies and hydrosalpinx diagnoses were typically made with clarity, and HSG has a better sensitivity and specificity for evaluating these abnormalities. Radiologists' and clinicians' comments in the Renbaum et al. study were largely consistent. This could be because there weren't many patients in the study. Nonetheless, our research indicated that there may be some largely consistent. This could be because there weren't many patients in the study. Nonetheless, our research indicated that there may be some disparities in radiologists' and clinicians' interpretations. Our results could be explained by a larger patient population.⁹

Many nations view infertility as a serious public health concern and a source of stigma. The prevalence of infertility is still only about 10% to 15% despite the increased services provided these days. Without performing an initial HSG procedure, an infertility workup is deemed incomplete. The shape of the uterine and tubal lumen can be determined with this easy, affordable, and safe test. It is critical that the procedure be carried out correctly, taking all necessary precautions. Infertile couples do not hesitate to seek early advice, employing cautious techniques, and analysing the results with intelligence. The majority of tubal abnormalities can be found during a fluoroscopic examination in as little as two minutes thanks to the quickness of HSG. In developing nations such as our own, HSG is still the primary test used to evaluate the fallopian tubes, and tubal disease is a major contributing factor to infertility in women. Although they are not a common cause of infertility, uterine abnormalities

should always be taken into account. They may have a negative impact on the success of pregnancies that are obtained through effective treatment of other, more prevalent infertility-causing factors. The study found that the age group of 20 to 25 years old, which corresponds to the peak of the fertile period, had the highest percentage of infertile patients (45.4%). However, the most common age group experiencing infertility in the studies by Malwadde EK et al and Dutta et al was 26 to 30 years old, which is slightly past the maximum fertile stage. The majority of the patients in our study—roughly 82%—had been infertile for one to five years. The fact that could be the reason for the shorter duration of infertility at presentation. Another factor that may have contributed to the short duration of infertility at presentation is awareness of the significance of early treatment. In the current study, 34.1% of patients had normal HSG results, suggesting that structural factors were not the cause of their infertility. 63.6 percent of the cases had tubal abnormalities. This is consistent with Akinola et al.'s findings (61.8%). Only one-fourth of the cases had tubal abnormalities, according to Sinawat et al. (2014). Malwadde EK et al. reported hydrosalpinx in 12.8% of patients, tubal block in 38.9%, and abnormal findings at HSG in 83.4% of patients.¹⁰

The radiography method used to assess the uterus and fallopian tubes is called Hysterosalpingography (HSG). Despite the development of newer modalities, it is still the best radiographic imaging procedure for visualizing the fallopian tubes and is primarily used for evaluating female infertility. Moreover, HSG is frequently less expensive and less invasive. The age group of 26–30 years old was the most often examined for uterine and fallopian tube abnormalities among the 375 patients in this study. This is consistent with research results from the Nnamdi Azikwe University Teaching Hospital in Nnewi, Nigeria, where the age group that could be attributed was most frequently studied was 25 to 29 years old. It disagrees, nevertheless, with the research done by Admassie and Negatuy. The difference to the belief that women in this community marry younger than women in Ethiopia. In 172 cases (45.9% of the total), secondary infertility was the most frequent indication, while in 164 cases (43.7%), primary infertility was the indication. 10.4% of the infertile individuals had an unclear type. Of the 120 patients enrolled in the study, up to 80% had secondary infertility as the reason for HSG, while only 20% had primary



infertility, according to another study done at Ladoké Akintola University of Technology College of Health Sciences Oshogbo, Nigeria. The study conducted at Nnamdi Azikwe University Teaching Hospital in Nigeria revealed that primary infertility was more common (44.8%) than secondary infertility (38.3%). These findings are in line with our findings regarding the indication for HSG.¹¹

One common radiographic technique used to examine female infertility hysterosalpingography (HSG). It is effective in identifying pathologies of the uterus cavity and fallopian tube, such as tubal occlusion and congenital uterine anomalies. Two hundred and three (203) infertile women participated in this study, and some of them received free ultrasound scans (USG). The majority of the women (50.74%) had secondary infertility at presentation, which is consistent with findings from earlier research conducted in Ghana and Nigeria. Conversely, research from China, Iran, and India, among other continents, revealed that primary infertility was more common in their subjects. Our results support the hypothesis that secondary infertility is more common in developing nations than primary infertility is in developed nations among women. Additionally, prior research indicates that developing nations have higher rates of risk factors like STDs, unhealthy reproductive practices, iatrogenic infections, and medical neglect of secondary infertility precursor conditions.¹²

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