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Publisher of open access books and journals
PJMLS
Print ISSN: 2707-4471. Online ISSN: 2707-448X

Research Article	Pak-Euro Journal of Medical and Life Sciences
DOI: 10.31580/pjmls.v6i4.2945	Copyright © All rights are reserved by Corresponding Author
Vol. 6 No. 4, 2023: pp. 419-424	
www.readersinsight.net/pjmls	**Revised:** November 30, 2023 **Accepted:** December 19, 2023
Submission: August 28, 2023	**Published Online:** December 31, 2023

ANALYZING THE USE OF HYSTEROSALPINGOGRAPHY IN PATIENTS WITH FERTILITY ISSUES

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Abstract

Background: *Infertility is a global health concern and hysterosalpingography (HSG) is a crucial radiological technique in infertility workup and remains a key modality for examining female infertility. Nonetheless, there are regional variations in the HSG results regarding infertility. From January 2021 to January 2022, a sample population at a territorial care hospital in Khyber Pakhtunkhwa (KPK), Pakistan, was used in this research to assess the efficacy and results of HSG in detecting reproductive difficulties.*

Objectives: *This study aimed to determine how well hysterosalpingography (HSG) performed as a diagnostic tool for evaluating the health of the uterus and fallopian tubes in a sample of 100 women who presented with infertility.*

Methods: *This Retrospective Study was carried out in the Department of Obstetrics & Gynecology Mardan Medical Complex, Mardan and conducted on one hundred women who had their fertility evaluated using HSG. Analyses were conducted on demographic data, HSG indications, results, and subsequent fertility treatments.*

Results: *Of the one hundred women who had HSG, forty per cent had tubal occlusions, and twenty per cent had bilateral occlusions. In 15% of the subjects, uterine anomalies such as fibroids and polyps were found. Peritubal adhesions were seen in 10% of the females. Within six months of having an HSG test, 25% of women with normal results got pregnant. The findings highlight the role that tubal and uterine diseases play in infertility as well as the value of using HSG to guide treatment decisions. These findings underscore the critical need for reliable diagnostic methods in the assessment of fertility and customized treatment regimens for infertile women.*

Conclusion: *HSG is an important test in fertility research that provides important information about fetal and vascular changes that can guide treatment options. To address the region's fertility problems effectively, KPK should increase access to these diagnostic services.*

Keywords: *Fallopian tube patency, Fertility assessment, HSG, Infertility, Uterine pathology*

INTRODUCTION

The condition characterized by the failure to achieve a clinical pregnancy after a year of frequent, unprotected sexual activity or due to a reproductive impairment, either alone or with a partner, is termed infertility (1). Infertility affects approximately 15% of couples in their reproductive years, impacting 9–18% of the general population (2). It is classified into primary infertility, where couples have never conceived, and secondary infertility, which occurs after a previous pregnancy, whether resulting in a live birth or not (3). Increasing rates of infertility are observed due to the rise in male infertility and delayed female fertility (4).

Male infertility is often linked to low semen parameters, while female infertility can result from fallopian tube obstruction, uterine anomalies, or anovulation (5). Tubal disorders account for 30 to 40% of infertility cases, with causes ranging from infections to surgical injuries, leading to blockages in different parts of the fallopian tubes (6). Uterine defects contribute to about 10% of female subfertility and may include congenital anomalies, intrauterine adhesions, synechiae, fibroids, and polyps (7). Anovulatory conditions, such as polycystic ovarian syndrome, premature ovarian failure, and functional hypothalamic amenorrhea, contribute to female infertility, and their assessment involves monitoring menstrual cycles and

hormone levels (8, 9). Fertility decreases with age, emphasizing the impact of female age on reproductive capacity (10). Recent studies attribute 52.05% of female infertility cases to anovulation (11).

Infertility, affecting 15-20% of couples globally, is influenced by various socio-economic and health-related factors (12). Developing countries, particularly in South Asia, often face significant stigma related to infertility (13). Hysterosalpingography (HSG), a fundamental diagnostic technique, plays a crucial role in assessing the uterus and fallopian tubes, providing real-time functional monitoring through the injection of radio-opaque dye into the cervix (14, 15). Despite advancements in reproductive engineering, HSG remains a valuable early test, detecting anatomic abnormalities like adhesions, tubal obstruction, and placental issues (16, 17).

In Khyber Pakhtunkhwa (KPK), Pakistan, where resources are limited, HSG serves as an essential tool for early infertility screening (18). This study aims to evaluate the utility of HSG in the Department of Obs & Gyne MMC, Mardan, examining its impact on diagnosing and treating obstetric complications in a sample of 100 women over one year (January 2021 to January 2022). The study addresses the gap in understanding the efficacy and outcomes of HSG in this region, emphasizing its potential as a diagnostic tool in resource-constrained settings.

MATERIALS AND METHODS

This retrospective investigation scrutinized the records of 100 women who underwent Hysterosalpingography (HSG) at the Department of Obstetrics and Gynecology, MMC, Mardan, between January 2021 and January 2022, with 60% seeking evaluation for primary infertility. Iodine-based contrast consistently featured in the HSG procedures, and a skilled radiologist specializing in obstetric imaging reviewed the images. The findings were categorized into uterine abnormalities (15%), peritubular adhesions (10%), tubal obstruction (40%), and mean (35%). To maximize privacy, identifiable patient data were meticulously excluded during data processing. Descriptive statistics were employed to ascertain the prevalence of physiological causes of infertility, determining the frequency and percentage of screening outcomes.

PARTICIPANTS

One hundred women participated in HSG as part of their fertility assessment. Inclusion criteria encompassed women of reproductive age presenting with primary or secondary infertility.

INCLUSION CRITERIA

Women aged 20–38 years, classified as primary infertile or experiencing secondary infertility, underwent HSG at a regional care clinic in Khyber Pakhtunkhwa, Pakistan, between January 2021 and January 2022.

EXCLUSION CRITERIA

Women aged 20–38 years, undergoing HSG at a regional care clinic in Khyber Pakhtunkhwa, Pakistan, between January 2021 and January 2022, were excluded if they did not meet the criteria for primary or secondary infertility.

DATA COLLECTION

Clinical data, including patient age, duration of infertility, HSG results, and subsequent treatment plans, were extracted from the hospital's electronic health record. A radiologist examined the radiographs obtained during HSG to identify any discrepancies.

ETHICAL CONSIDERATIONS

The study received approval from the Institutional Review Committee of the Regional Service Hospital. Rigorous measures were applied to ensure the identification and classification of all patient data, upholding confidentiality.

RESULTS

In this present investigation, 100 individuals undergoing Hysterosalpingography (HSG) for infertility screening at the Department of Obstetrics and Gynecology, MMC, Mardan, were included within the period spanning January 2021 to January 2022. The average age of the participants was 28.7 years. Upon assessing the reasons for HSG, it was noted that 60% of the patients exhibited primary infertility, while the remaining 40% presented with secondary infertility (Table I).

Table I. Patient demographics and Iindications for HSG demographics

Total Samples	**100 (Women)**
Mean Age	28.7 years
Age Range	20 - 38 years
Indications for HSG	
Primary Infertility	60% (n=60)
Secondary Infertility	40% (n=40)

HSG results showed multiple findings, including 40% of patients with tubal rod disease, 20% with unilateral rod disease, and 20% with bilateral rod disease. Uterine Abnormalities were observed in 15% patients while Peritubal Adhesions were observed in 10% patients (Table II).

Table II. Findings from HSG

HSG Findings	**Percentage of Patients (n)**
Normal	35% (n=35)
Tubal Occlusion	40% (n=40)
- Bilateral Occlusion	20% (n=20)
- Unilateral Occlusion	20% (n=20)
Uterine Abnormalities	15% (n=15)
Peritubal Adhesions	10% (n=10)

Based on Post-HSG Fertility Treatment and Outcomes, timed intercourse was observed in 40% patients, Ovulation Induction was observed in 20% patients, Referral for Laparoscopy/IVF was observed in 40% patients while in 25% patient's pregnancy was achieved within six months (Table III).

Table III. Post-HSG fertility treatment and outcomes

Fertility Treatment	**Percentage of patients (n)**
Timed Intercourse	40% (n=40)
Ovulation Induction	20% (n=20)
Referral for Laparoscopy/IVF	40% (n=40)
Pregnancy Achieved within 6 Months	25% (n=25)

DISCUSSION

The findings of this study shed light on the demographic and clinical aspects of 100 women undergoing Hysterosalpingography (HSG) for infertility screening at Obs & Gyne MMC, Mardan, between January 2021 and January 2022. The mean age was 28.7 years, reflecting the age distribution within the sample, providing context for the prevalence of infertility in this particular age group (19).

Notably, the categorization of infertility into primary and secondary cases revealed that 60% of the participants experienced primary infertility, emphasizing the challenges faced by couples attempting to conceive for the first time. In contrast, 40% exhibited secondary infertility, indicating difficulties in achieving a subsequent pregnancy despite having experienced prior conception. These distinctions underscore the diverse nature of infertility issues encountered by women undergoing HSG, necessitating tailored diagnostic and therapeutic approaches (22).

The prevalence of primary infertility aligns with global trends, highlighting the importance of early intervention and fertility assessments for couples planning to start a family (21). Understanding the distribution of primary and secondary infertility within the studied population contributes valuable insights to reproductive health strategies and resource allocation.

Furthermore, the utilization of iodine-based contrast consistently in HSG procedures, along with expert radiological review, ensures the reliability of the diagnostic process (23). The results were

systematically classified into categories, revealing varied etiologies contributing to infertility. Uterine abnormalities, peritubular adhesions, and tubal obstruction emerged as prominent factors, each requiring targeted attention in infertility evaluations.

It is crucial to acknowledge the limitations of this study, such as its retrospective nature and reliance on electronic health records. Additionally, the emphasis on privacy led to the exclusion of identifiable patient information during data processing, maintaining confidentiality but limiting a more detailed analysis (24).

The findings of the current study align with and contribute to the existing body of research on infertility evaluations, particularly within the context of Hysterosalpingography (HSG). Several key parallels and distinctions can be drawn when comparing our study with previous research.

Firstly, the prevalence of primary and secondary infertility in our study resonates with global trends documented in earlier studies. Similarities in demographic characteristics, such as age distribution, indicate consistency in the population seeking fertility assessments (25). This reaffirms the universal nature of fertility challenges and the need for comprehensive reproductive healthcare strategies worldwide.

Secondly, the diagnostic categorizations, including uterine abnormalities, peritubular adhesions, and tubal obstruction, echo findings from prior studies emphasizing the importance of these factors in contributing to infertility (17). The shared insights into the anatomical and functional aspects of reproductive health provide a cumulative understanding that can guide future interventions and treatment modalities.

However, it is essential to note that every study contributes unique perspectives based on its specific population and research design. Our study, conducted in the regional care clinic of Khyber Pakhtunkhwa, Pakistan, adds valuable insights to the global discourse by highlighting the challenges and patterns specific to this geographic location. Factors such as cultural practices, healthcare accessibility, and regional health disparities may influence infertility outcomes, emphasizing the importance of context-specific research (26).

Additionally, the use of HSG as a diagnostic tool, while well-established in reproductive medicine, continues to be refined with advancements in technology and imaging techniques. Our study reinforces the enduring relevance of HSG as a valuable and accessible diagnostic procedure, especially in resource-constrained settings. This resonates with the broader trend observed in recent studies that underscore the ongoing significance of traditional diagnostic methods in complementing emerging technologies (19).

In summary, while our study builds upon the collective knowledge on infertility evaluations, it also underscores the need for a nuanced understanding of regional variations and the evolving landscape of diagnostic methodologies. Collaborative efforts that integrate findings from diverse settings contribute to a more comprehensive and context-aware approach to addressing infertility challenges

CONCLUSION

In conclusion, the comprehensive assessment of HSG results in this study adds to the body of knowledge regarding the prevalence and factors associated with infertility in the studied population. The insights gained from demographic characteristics, categorization of infertility types, and specific diagnostic outcomes contribute to the ongoing dialogue on effective infertility management. As research in this field progresses, a more nuanced understanding of infertility patterns and tailored interventions can be developed to address the diverse needs of individuals seeking fertility evaluation and treatment.

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