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Exploring the Role of Panendoscopy versus Hysterosalpingography in the Management of Infertility

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ABSTRACT

Aim: A popular radiologic modality used for the first workup of female infertile patients is hysterosalpingography (HSG), which is used to assess for any gross intrauterine abnormalities or tubal patency. Radiation exposure is a danger associated with HSG, despite being a readily available and reasonably priced outpatient surgery. The study aimed to assess the diagnostic utility of hysterolaparoscopy and HSG in infertile women, as well as their respective roles in the diagnosis and treatment of infertility. **Patients and methods:** The study was conducted between June 2019 and June 2021. It was done in the obstetrics and gynecology departments of EL Hussin University Hospital. The research included all women between the ages of 20 and 40 who were receiving infertility treatment at our outpatient department (OPD). The research excluded participants who had an adverse response to the dye used in HSG or who had an acute infection of the vagina or cervical region. The research excluded individuals with known instances of pelvic inflammatory illness and those who became pregnant prior to hysteroscopy procedures. **Results:** The study included 200 women who were infertile either initially or later and were examined. For the assessment of the uterine cavity, 76 women with primary infertility and 124 women with secondary infertility. There was a significant difference between the two groups as regards the statement of normal cavity and the detection of accidental abnormalities, HSG showed normal uterine cavity in 186 cases and 14 only with apparent abnormalities while only 156 cases showed a normal uterine cavity when inspected by hysteroscopy and in 44 cases organic lesions were encountered ($P < 0.05$). Also there were a significant difference in the detection of cervicitis ($P < 0.05$). there was a superiority of the panendoscopy when compared with HSG ($P < 0.05$). **Conclusion:** The accidental results found by hysteroscopy amounted to more than those found by HSG. Our study's findings demonstrate hysterolaparoscopy's superiority over HSG. HSG can miss a large number of critical incidental findings, even if its sensitivity for tubal patency detection is parallel with diagnostic hysterolaparoscopy. Therefore, wherever the technique is accessible, diagnostic hysterolaparoscopy should be provided as the

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first-line modality for the examination of infertility.

Keywords: Hysteroscopy, Laparoscopy, Infertility, Endoscopy

INTRODUCTION

There is ongoing debate on the appropriateness of routine hysteroscopy in patients receiving diagnostic laparoscopy as part of an infertility work up. A rising body of research is addressing the use of hysterosalpingography (HSG) as a crucial tool to utilise in the diagnosis and treatment of infertile couples, even though the majority of clinics still employ HSG as their standard test to examine the uterine cavity. Each has benefits and drawbacks, and hysteroscopy and HSG approach the uterine cavity in various ways. The ability to image the tubes is a significant benefit of HSG [1].

Nevertheless, HSG has a number of intrinsic drawbacks, such as the possibility of infection, ionising radiation exposure, contrast material exposure, and sometimes significant patient pain. The diagnosis of anomalies that protrude into the uterine cavity, such as polyps, submucous myomas, and endometrial adhesions, is more accurate with hysteroscopy because it provides direct visualisation of the uterine cavity and cervical canal. When an intrauterine anomaly is detected, hysteroscopy should be performed as the screening approach; however, in cases of infertility, HSG should be used instead of hysteroscopy since hysteroscopy is insufficient to determine the tubal patency [2].

Hysteroscopy is still a great supplementary tool, nonetheless, for assessing the uterine features of infertile women. A component of the infertility works up is laparoscopy. It could be beneficial to schedule a hysteroscopy with a laparoscopy because the patient is under general anaesthesia [3].

The purpose of this research was to assess the efficacy of this technique in identifying uterine reasons of female infertility by analysing the data from diagnostic hysteoscopy, which is regularly conducted during diagnostic laparoscopy in the examination of infertile patients.

PATIENTS AND METHODS

This cross-sectional study was conducted at El Hussin University Hospital between June 2019 and June 2021. The following inclusion criteria were met: 200 patients with primary or secondary infertility lasting more than a year, aged 20 to 40, were included in the study. Individuals with secondary infertility had at least one previous pregnancy, regardless of how it ended up, whereas individuals with primary infertility had never given birth before.

- Individuals who were unable to conceive after six cycles of treatment for irregular ovulation.

- This surgery was recommended for patients whose infertility could not be explained, individuals who may have had fallopian tube issues or endometriosis.

Exclusion criteria: Atypical seminogram, individuals who have active vaginal infections or active pelvic inflammatory disease are not eligible, when surgery impossible. The research excluded participants who had an adverse response to the dye used in HSG or who had an acute infection of the vagina or cervical region. The research excluded those who became pregnant prior to hysteroscopy procedures.

In the early follicular phase, all patients had diagnostic hysterolaparoscopy along with chromopertubation testing. For analysis, information on the prevalence of different lesions was acquired. The husband had a relevant evaluation in addition to a comprehensive history and clinical examination. Age, religion, level of education, and socioeconomic status were among the demographic data gathered. The prearranged investigations were finished in order to determine eligibility for surgery. The patient had a preanesthetic examination the day before the procedure. HSG was performed as an outpatient procedure between Days 6 and 11 of the menstrual cycle, ideally Day 8.

Statistical analysis by SPSS for Windows 20.0

RESULTS

200 women participated in this study, 76 women with primary infertility and 124 women with secondary infertility. The average age in women with primary infertility was 26.5± 3.8 years and 26.4 ± 4.1 years in women with secondary infertility with no significant difference between the two groups. Table 1 indicates that there was no significant difference between the two groups in BMI, occupation, education, smoking and duration of infertility.

Table 2 and 3 indicate the evaluation of uterine cavity by HSG and hysteroscopy. There was a significant difference between the two groups as regards the statement of normal cavity and the detection of accidental abnormalities, HSG showed normal uterine cavity in 186 cases and 14 only with apparent abnormalities while only 156 cases showed a normal uterine cavity when inspected by hysteroscopy and in 44 cases organic lesions were encountered ($P < 0.05$). Also there were a significant difference in the detection of cervicitis ($P < 0.05$). otherwise there was no significant difference between the two groups in detection of other lesions. Laparoscopic abnormalities were noted in Table 4. tubal

block was detected only in 4 cases with primary infertility and 17 cases of secondary infertility. Laparoscopy detected 27 cases of tub ovarian mass, 50 cases of endometriosis, 32 cases of PID and 42 cases of pelvic adhesions.

Table 5 showed a comparison of tubal patency and pelvic adhesions detection on HSG and combined hysterolaparoscopy with a superiority of the pan endoscopy when compared with HSG (P< 0.05).

Table 1. The Demographic parameters of the study populations

Type of infertility	1ry infertility (n= 76)	2ry infertility (n= 124)	P-value
Age (y)	26.5 ± 3.8	26.4 ± 4.1	>0.05
BMI	21.4 ± 1.9	21.5 ± 1.6	>0.05
Occupation (%)			
Yes	32.9	34.7	>0.05
No	67.1	65.3	
Education (%)			
High school or more	44.7	47.6	>0.05
Before high school	55.3	52.4	
Smokers (%)	19.7	20.9	>0.05
Duration of infertility (y)	3.7 ± 1.2	3.9 ± 1.3	>0.05

Table 2. Evaluation of uterine cavity by HSG and hysteroscopy

	Hysteroscopic finding	No (%)	HSG finding	No (%)	P value
Normal cavity	156	78	186	93	< 0.05
Abnormal	44	22	14	7	< 0.05
Septum	6	3	5	2.5	>0.05
Adhesions	4	2	3	1.5	>0.05
Ostial fibrosis	4	2	2	1	>0.05
Polyps	5	2.5	4	2	>0.05
Endometrial polyposis	2	1	0	0	>0.05
Atrophic endometrium	2	1	0	0	>0.05
Cervicitis	15	7.5	0	0	< 0.05
Cervical polyp	3	1.5	0	0	>0.05
Cervical stenosis	3	1.5	0	0	>0.05

Table 3. Comparison of uterine cavity findings on HSG and hysteroscopy

		Hysteroscopic findings		Total	P - value
		Abnormal	Normal		
HSG findings	Abnormal	12 (TP)	2 (FP)	14	< 0.05
	Normal	32 (FN)	154 (TN)	186	
Total		44	156		

Table 4. Diagnostic laparoscopic findings

Findings	1ry infertility (76)	2ry infertility (124)
Tubal block	4	17
Tubo-ovarian mass	6	21
Endometriosis	15	35
PID	6	26
Pelvic adhesions	5	37

Table 5. Comparison of tubal patency and pelvic adhesions detection on HSG and combined hysterolaparoscopy

		Tubal findings on hysterolaparoscopyscopy		Total	P - value
		Abnormal	Normal		
Tubal & pelvic adhesions findings on HSG	Abnormal	15	3	18	< 0.05
	Normal	6	179	185	
Total		21	182		

DISCUSSION

In this study, we compared HSG and hysterolaparoscopy while taking the tubal and uterine cavities into independent consideration. In 186 women, HSG was normal (compared to 156 only by hysteroscopy), whereas in 14 women it was abnormal (compared to 44 by hysteroscopy). Comparable findings were also reported by Ibinaiye et al. [4] (normal uterine cavity on HSG in 75.9% and abnormal in 24.1%). According to studies by Chauhan et al. [5] and Vaid et al. [6], the detection rates of abnormal uterine cavities on HSG are 13% and 8.29%, respectively. In our analysis, filling deficiencies accounted for 10.8% of all abnormal uterine cavity findings on HSG, with irregular uterine cavities coming in second (7.64%).

Among women who had the hysteroscopic operation, 44 women had aberrant outcomes, and 156 women had normal hysteroscopic findings. Whereas Chauhan et al. [5] reported aberrant results in 20% of instances, Wadhwa et al. [7] discovered abnormal findings in 35.51% of cases. For uterine cavity results, there was a 71.3% agreement between the two techniques in the current investigation. Comparatively speaking, there was a reasonable significant difference in the findings between hysteroscopy and HSG (P-value< 0.05). This indicates that a sizable portion of aberrant uterine cavity findings may go unnoticed by HSG.

In an investigation, Wadhwa et al. [7] reported similar results, with 75% agreement between the two techniques. Regarding the sensitivity and specificity of HSG in identifying anomalies in the uterus, there are conflicting findings across research. As a result, it appears that the sensitivity and specificity fall between 21–81 and 70–98%, respectively [8-12]. In their study, Taşkın et al. [13] discovered a poor sensitivity; however, this could have been caused by the male partners in the majority of the couples that visited their clinic having male factor infertility. According to Nigam et al.'s study [14], there was a false-negative rate of 12.96% and a 70% positive predictive value.

In 44 cases, we observed accidental abnormalities that were discovered by hysteroscopy. Fertility may be negatively impacted by these unintentional discoveries, many of which like endometrial polyps and incomplete septums are easily addressed with hysteroscopy. Hysteroscopically detected incidental findings were also identified in 15 to 32 % of cases in other investigations [15-17].

The benefit of hysterolaparoscopy is that it may be used to treat tubal abnormalities among other abdominopelvic pathologies as well as for diagnostic purposes. Chromatopertubation was used in this investigation to evaluate the tubal patency of the female infertility patients.

For the identification of tubal patency on HSG, HSG's sensitivity and specificity were reported by Agrawal et al. [18] to be 100% and 52.31%, respectively. Vaid et al. discovered that HSG had a sensitivity of 80.6% and a specificity of 81.5% when comparing the same parameters. It was discovered that there was 74% agreement between the two modalities [6]. The likelihood of tubal blockage on hysterolaparoscopy

was determined to be extremely low by Agrawal et al. [18], but HSG was normal.

Comparable outcomes were seen in the current investigation, wherein HSG was reported to have tubal dye leakage, although no patient exhibited tubal obstruction upon chromopertubation.

LIMITATIONS OF THE STUDY

This study's sole weakness is that the clinical pregnancy rate and live birth rates—parameters that indicate the effectiveness of fertility treatments—were not examined in connection with the results of hysterolaparoscopic procedures.

RECOMMENDATIONS

Future research, however, should focus on examining the relationship between hysterolaparoscopic results and variables like clinical pregnancy rate and live birth rates, among other things, as this is a distinct field.

CONCLUSION

Our study's findings highlight hysterolaparoscopy's superiority over HSG. While the sensitivity of HSG for tubal patency identification is near to diagnostic hysterolaparoscopy, the technique may miss a large proportion of accidental discoveries. Hysterolaparoscopy for diagnostic purposes also has the benefit of revealing the specifics of various abdominopelvic illnesses and enabling therapeutic action in the same location. Therefore, wherever the technique is accessible, diagnostic hysterolaparoscopy should be provided as the first-line modality for the examination of infertility. A hysterolaparoscopy should always be used to confirm an abnormal HSG.

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