Assessment of Uterine Factor in Infertile Women : Hysterosalpingography vs Hysteroscopy

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Abstract

The objective of this study was to evaluate the diagnostic accuracy of hystero-salpingography (HSG) in detecting uterine cavity abnormalities in infertile patients, with reference to hysteroscopy as the gold standard method. 60 infertile women were investigated with both HSG and hysteroscopy. Statistical analysis was performed. As a test for the detection of uterine cavity abnormalities, HSG in comparison with hysteroscopy had 60% sensitivity, 90% specificity, 10% false positive value and 40% false negative value. HSG is not able to diagnose polyps, septum and submucous fibroids with significant accuracy. Therefore hysteroscopy is indicated for confirmation.

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Key Words : Hysterosalpingography; Hysteroscopy; Infertility

Introduction

The problem of infertility is common in day to day practice. Few patients conceive with mere diagnostic procedures and few never do so despite running through a long list of investigations and treatment. Basic investigations for female infertility include assessment of cervical, uterine, tubal and ovulatory factors. Traditionally, uterine cavity was assessed by HSG. However, in the recent past, hysteroscopy is being increasingly used for direct visualization of uterine cavity and is considered superior to HSG by many workers. The present study was carried out to compare the diagnostic efficacy of HSG and hysteroscopy in assessment of uterine factor in infertile patients.

Material and Methods

The present study was carried out from January 1998 to March 2000. A total number of 60 patients attending infertility clinic were selected. These patients had complete infertility work-up including semen analysis, ovulatory study and hormonal assay. HSG was performed first followed by hysteroscopy. The hysteroscopic study was considered as a gold standard method.

Hysterosalpingography was performed in the proliferative phase of menstrual cycle without using analgesics or anaesthesia. Half an hour before HSG, injection Buscopan (Hyoscin Butyl Bromide) 0.5 ml was given intramuscularly to avoid tubal spasm. Cervix was visualized with the help of Sim's speculum and the anterior lip of cervix was held with tenaculum. Water-soluble contrast media was injected slowly by using Leech Wilkinson canula and the films were taken under fluoroscopic monitoring.

Hysteroscopy was performed immediately after cessation of menstrual flow, that is in early proliferative phase. Under

general anaesthesia, cervix was dilated up to number seven Hegar's dilator. Hysteroscope was introduced. Maximum distension media (saline, glycine) pressure used was 100 mm of Hg. The cervical canal was examined first, scope was introduced further-fundus was examined, panoramic view with two ostia was seen, the anterior, posterior and lateral walls were scrutinized.

Results

The study included 60 patients with almost equal distribution of primary and secondary infertility (Table 1). All the patients were subjected to HSG as well as hysteroscopy. Among 60 patients subjected to HSG, abnormal findings were noted in 16 as compared to 20 abnormal findings in hysteroscopy in same number of patients. Five patients had normal uterine cavity on HSG but hysteroscopy showed intra-uterine pathology. Three patients had abnormal findings on HSG but hysteroscopy was found to be normal. In some of the patients more definitive diagnosis could be reached only after hysteroscopy (Table 2). As an investigating modality HSG was found to have low sensitivity but high specificity (Table 3).

Table 1

Demographic characteristics of patients

Number of patients	60
Primary infertility	32
Secondary infertility	5
Average age	26.5 ± 5.4 years
Duration of infertility	5 ± 2.5 years

Discussion

Over the years we have been impressed with the positive co-relation between findings of HSG and hysteroscopy. However, in last few years there have been conflicting reports about diagnostic accuracy of

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Table 2**Discrepancies between HSG & Hysteroscopy findings**

HSG	Hysteroscopy
Normal	Endometrial polyp
Normal	Endometrial hyperplasia
Normal	Submucous fibroid
Normal	Subseptate uterus
Normal	Arcuate uterus
Multiple filling defects	Submucous myoma
Arcuate uterus	Adhesions
Arcuate uterus	Subseptate uterus
Filling defects	Polyp
Filling defects	Adhesions
Unicornuate uterus	Normal
Arcuate uterus	Normal
Polyp	Normal

HSG. Study done by Kessler in 1986, Brown in 2000 and Cicnelli in 2001 showed that hysteroscopy gives more accurate findings than HSG and may replace it [1,2,3]. In comparison, Snowden et al [4] found HSG a more reliable technique. This study was carried out to compare both these techniques. HSG and hysteroscopic findings as per specific anomalies are discussed below.

Fibroid uterus : HSG shows an intrauterine filling defect in presence of submucous tumor, but air bubbles cause often-misleading diagnoses. In this study, HSG could diagnose only one fibroid uterus while hysteroscopy detected fibroid in four cases. The three cases, which were missed by HSG-the diagnosis was filling defect in two cases and normal HSG in one. Kessler et al [1] found agreement between HSG and hysteroscopy findings in only 57.5% cases. Therefore, direct visualization of uterine cavity is superior to HSG for the diagnosis of submucous fibroid.

Endometrial Polyp : A single, regular, round or elongated filling defect within an otherwise normal uterine shadow suggests an endometrial polyp. HSG detected one polyp but hysteroscopy done subsequently showed a normal uterine cavity. There was one normal HSG and one finding of filling defect; both the cases had polyp on hysteroscopy. Study by Ganglione et al [5] showed that HSG diagnosed polyp in six cases while hysteroscopy confirmed only two. It can be concluded that hysteroscopy is superior for diagnosis of intrauterine polyp.

Adhesions : As per Fayeze et al "HSG is a screening procedure for intrauterine adhesions and hysteroscopy need not be done" [6]. Study by Ganglione et al showed that HSG detected synechiae in 6 cases while hysteroscopy picked up in nine [5]. In this study, 2 cases of intrauterine adhesions were detected. In all these

Table 3**Statistical analysis of results**

Sensitivity of HSG	60%
Specificity of HSG	90%
False positive	10%
False negative	40%

cases HSG diagnosis was different from that of hysteroscopy. Though HSG picked up the abnormality, it did not come to a conclusion. Exact diagnosis was given by hysteroscopy.

Endometrial hyperplasia : There were 3 cases of endometrial hyperplasia detected by hysteroscopy but all were missed by HSG. Out of these, 2 were of simple hyperplasia and one was atypical hyperplasia. The diagnosis was confirmed by histopathological examination of hysteroscopic guided biopsy specimen. Ganglione reported diagnosis of hyperplasia in 8 cases while hysteroscopy detected in seven [5]. The findings are contrary to our finding. However, since endometrial hyperplasia is essentially a histopathological diagnosis, hysteroscopy should be the investigation of choice.

Congenital anomalies of uterus : The diagnosis of double uterus is generally made from HSG but it cannot differentiate between subseptate and bicornuate uterus or between complete septum and didelphic uterus. Study by Fayeze et al [6] and Ganglione [5] shows that HSG can pick-up uterine anomalies more or less correctly. On the contrary, Sheth et al, diagnosed 36 patients having bicornuate uterus on HSG but 34 of them were found to have septate uterus on hysteroscopy [7]. The most frequently used diagnostic approach consists of combined hysteroscopy and laparoscopy. In this study, there were 6 uteri which were diagnosed as arcuate by HSG but 5 of them were detected as subseptate by combined hysteroscopic and laparoscopic approach. Two unicornuate uteri were detected by HSG, out of which only one was confirmed by hysteroscopy. HSG can be used for initial diagnosis of congenital uterine anomalies but confirmation by hystero-laparoscopy is mandatory.

Sensitivity and specificity

Statistical analyses show specificity of HSG as 90% and false negative value as 40%. These values are comparable with other studies [5,8,9]. High specificity indicates significant role for HSG as screening procedure but high false negative values show that intrauterine pathology can be missed by relying solely on HSG. In our study HSG gave only 10% false positive results compared to 39.3% and 30% by Ganglione and Kessler respectively [5,1]. This conflict between the result of our study and those by other authors is probably

due to difference in technique and interpretation. Before HSG, each patient in our study received injection Buscopan, and the dye was injected slowly to avoid uterine spasm that may mimic intrauterine defects.

HSG is having a sensitivity of only 60% as far as diagnosis of intrauterine lesions are concerned, therefore it must be supplemented by hysteroscopy. However, hysteroscopy is an observer dependent technique and its accuracy is directly proportional to experience of the observer.

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