

# Hysterosalpingography Vs Hysteroscopy in the Detection of Intrauterine Pathology in Infertility

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## ABSTRACT

**Background:** This study was to compare the accuracy of hysterosalpingography (HSG) with hysteroscopy (HSC) in detection of uterine pathology in patients with infertility.

**Methods:** This is a prospective comparative study done among 50 new cases of primary and secondary infertility presenting to infertility clinic of Tribhuvan University Teaching Hospital from March 2006 – 2007. HSG was performed in the proliferative phase of menstrual cycle followed by HSC in the proliferative phase of the same or the following cycle. Intra uterine findings on HSG were evaluated and compared with hysteroscopic findings.

**Results:** Out of 50 cases, HSG revealed normal findings in 49 cases (98%) and HSC demonstrated normal uterine cavity in 44 of the cases (88%). There was one abnormality (2%) shown on HSG (subseptate uterus) which was confirmed at HSC. HSC demonstrated six cases (12%) of intrauterine pathologies and these were endometrial polyps, subseptate uterus and submucous myoma. HSG in the detection of intrauterine pathology had a sensitivity (SV) of 16.7% (95% CI 0.9-63.5), specificity (SP) 100% (95% CI 90-100), positive predictive value (PPV) 100% (95% CI 5.5-100), negative predictive value (NPV) 89.8% (95% CI 77-96.2), false negative rate (FNR) 83.3% and accuracy rate (AR) 90%.

**Conclusion:** HSG is a specific, but not sensitive predictor of uterine pathology. However, HSG did not provide any additional finding in comparison to HSC. Therefore, HSG is not advisable in the detection of uterine pathology in infertility patients.

**Key words:** diagnostic hysteroscopy, hysterosalpingography, infertility, uterine cavity.

## INTRODUCTION

Infertility is a global health issue affecting approximately 8 to 10% of couples worldwide.<sup>1</sup> Its prevalence is varying in South Asia as 4% in Bangladesh and Sri Lanka, 5% in Pakistan and 6% in Nepal. Similar rate has been reported by World Fertility Survey.<sup>2</sup> Although uterine pathology affecting fertility may not exceed 10% of couples,

successful reproduction can sometimes be significantly affected.<sup>3</sup>

HSG has provided a valuable adjunct to observe the architecture and symmetry of the uterine cavity. Although HSG is an excellent screening procedure, it is associated with considerable false positive findings for both tubal patency and uterine cavity abnormalities.<sup>4</sup>

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Proper technique in performing an HSG is imperative since inadequate uterine distension may result in poor visualization and overzealous instillation may easily obscure uterine pathology.<sup>5,6</sup>

HSC is an outpatient procedure that does not require anaesthesia and has better patient compliance and thus constitutes a definitive diagnostic test.<sup>7</sup> HSC can reveal the shape of the uterine cavity and locate submucosal lesions, congenital uterine anomalies, intrauterine adhesions (IUIAs) and submucous lesions.<sup>8</sup> Moreover, HSC is useful in identifying endometrial abnormalities not detectable on HSG.<sup>9</sup> HSC is more accurate than HSG because of the false positive and false negative rates associated with HSG.<sup>10,11</sup>

The objective of this study was to investigate the accuracy of HSG in comparison to HSC in the detection of intrauterine pathology in infertility.

**METHODS**

A prospective comparative study was conducted in Radiology department and infertility clinic, Obstetrics and Gynaecology department, TUTH, Kathmandu from March 15, 2006 - March 15, 2007. Ethical approval and patient consent was taken. Following the convenience sampling, 50 new cases of primary and secondary infertility were included in the study. Women with acute genital tract infections, suspicion of cervical malignancy, cardiorespiratory disease, ongoing pregnancy and previous history of HSG were excluded. HSG was performed in the proliferative phase of the menstrual cycle followed by HSC in the proliferative phase of the same or the following cycle consecutively to the same patient. The findings of both the investigations were compared later. Data collection and statistical analysis were done by using Statistical Package for Social Science (SPSS) version 11.5.

**RESULT**

During the study period, there were total 520 cases of infertility attended, 140 were new cases and 380 were old cases. Out of 140, 50 of them passed through the inclusion criteria and were enrolled in the study. Out of 50 infertile women, 42 were primary infertility cases and eight were secondary infertility cases. HSG revealed normal uterine cavity in 49 women (98%) while HSC confirmed only 44 (88%) normal uterine cavities. HSG detected only one (2%) abnormal uterine cavity whereas HSC demonstrated six (12%). One case (2%) that could be detected by HSG was subseptate uterus which was confirmed at HSC. The six abnormal cases according to HSC were endometrial polyps, subseptate uterus and submucous myoma (Table 1, 2).

**Table 1. Hysterosalpingographic findings**

HSG findings	Frequency	Percent
Normal	49	98
Subseptate uterus	1	2
Total	50	100

**Table 2. Hysteroscopic findings**

HSC findings	Frequency	Percent
Normal	44	88
Subseptate uterus	2	4
Endometrial polyp	3	6
Submucous myoma	1	2
Total	50	100

HSG could not detect five of the intrauterine abnormalities which could be visualized at HSC. These included three endometrial polyps and submucous myoma and subseptate uterus one each. From this study, HSG in the detection of intrauterine pathology had a SV of 16.7% (95% CI 0.9-63.5), SP 100% (95% CI 90-100), PPV 100% (95% CI 5.5-100), NPV 89.8% (95% CI 77-96.2), False positive rate (FPR) close to zero, FNR 83.3% and accuracy rate 90% (Table 3).

**Table 3. Comparison between HSG and HSC**

HSG	HSC		Total	p value
	Abnormal	Normal		
Abnormal	1 16.7%	0	1 2.0%	0.120
Normal	5 83.3%	44 100.0%	49 98.0%	
Total	6 100.0%	44 100.0%	50 100.0%	

**DISCUSSION**

Successful reproduction can sometimes be significantly affected by intrauterine abnormalities. HSG and HSC are two different approaches to view the uterine cavity. HSG provides a useful, albeit indirect image of the uterine cavity. The direct view of the uterine cavity through HSC offers a significant advantage over other diagnostic methods which offer only a blind or indirect view of the cavity.

In the present study, 5 (10%) of the intrauterine pathology could not be detected by HSG as compared to HSC. This finding is similar to various other studies.<sup>12,13</sup> Another study stated that HSG is inaccurate in diagnosing small

submucous myoma and endometrial polyp.<sup>14</sup> This was supported by another study and mentioned that HSC was very valuable in disclosing small intrauterine lesions.<sup>15</sup>

The enthusiasm for HSC has been based on the assumption that this diagnostic procedure is able to pick up small intrauterine lesions that might not otherwise be readily diagnosed by HSG. In support of this, one study reported that HSC apparently determined the diagnosis of undetected radiographic abnormalities (small endometrial polyps, IUAs and submucous myomas) in 62% of the 142 patients examined.<sup>16</sup>

Several reports have noted unsuspected intrauterine lesions in one-third or more of patients undergoing HSC and found intrauterine lesions in 29% of their 1100 diagnostic HSC,<sup>17</sup> whereas two other studies<sup>18,19</sup> reported that HSC revealed intrauterine disease (such as endometrial polyps and IUAs) which were unsuspected or previously undetected by HSG in 39% and 44% respectively.

The differences between HSG and HSC were observed mainly in the detection of endometrial polyps and submucous myoma as HSG could not detect them. This could probably be due to the fact that the size of endometrial polyps and submucous myoma were too small for HSG to show any filling defect.

In this study, the accuracy rate of HSG was 90% which is close to the other studies showing accuracy rate of HSG as 73.2%, 73%, 74.1% and 74.8% respectively in comparison to HSC.<sup>7,9,20,21</sup>

This study had no case of abnormal HSG with normal finding in HSC. Therefore, false positive rate of HSG is close to zero. The false negative rate is higher (83.3%). However, different other studies reported false positive rate ranging from 11.7 to 18% and false negative rate ranging from 13.3 to 35.4%.<sup>10,21</sup>

In this study, HSG in the detection of intrauterine lesions had very low SV 16.7% (95% CI 0.9-63.5), 100% SP (95% CI 90-100), 100% PPV (95% CI 5.5-100) and NPV 89.8% (95% CI 77-96.2) in comparison to HSC. Hence, this study demonstrated HSG is a specific but not sensitive predictor of uterine pathology in infertility patients as compared with HSC which was comparable with another study.<sup>22</sup>

However, in contrast to this study, various other studies revealed high SV, low SP, low PPV and very high NPV.<sup>12,16</sup> In a study conducted by Preutthipan et al,<sup>7</sup> HSG revealed SV 98%, SP 34.9%, PPV 69.8% and NPV 92% in comparison to HSC in the detection of intrauterine pathology. Similarly, a study by Roma et al<sup>9</sup> showed SV 81.2%, SP 80.4%, PPV 63.4% and NPV 83.7% as compared with HSC. Likewise,

another study carried out by Golan et al<sup>11</sup> found SV 98%, SP 15%, PPV 45% and NPV 95% for HSG.

As in the present study, since HSG had no FPR, HSG showed 100% SP and PPV in the detection of intrauterine pathology as compared to HSC. In the contrary, unlike other studies, this study revealed a very low SV of HSG which could be due to the fact that HSC disclosed small intrauterine lesions (10%) that were otherwise not detected by HSG.

So, when intrauterine lesion is suspected in infertility patients, HSC should be the first option for direct visualization of cavity and early detection of intrauterine pathology.

## CONCLUSION

This study revealed hysterosalpingography is a specific but not sensitive predictor of uterine pathology. Besides, hysterosalpingography did not provide any additional finding in comparison to hysteroscopy. Hence, it can be concluded that hysterosalpingography is not advisable in the detection of uterine pathology in infertility patients.

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