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Original Research Article

Laparoscopy as first line investigation in diagnosing Tubo-peritoneal factors in Infertility

Mahajan Geetu[1], Arora Arun[*2]

[1]Assisstant Professor, Department of Obstetrics and Gynaecology, Acharya Shree Chander College of Medical Sciences and Hospital, Sidhra Jammu, India
[2]Assisstant Professor, Department of Obstetrics and Gynaecology, The White Medical College and Hospital, Bungal Punjab, India

Corresponding Author:
Arora Arun
Assisstant Professor, Department of Obstetrics and Gynaecology, The White Medical College and Hospital, Bungal Punjab, India
Email: pushpanjalilife@gmail.com

Abstract

Introduction Hysterosalpingography has been used as first line investigation in assessing the Tubo-peritoneal causes of infertility. But it has lot of limitations. So the present study was conducted to prove the significance of laparoscopy as first line investigation for detecting tubo-peritoneal abnormalities in infertile patients. **Methods:** A prospective study was conducted on 100 patients who presented with complaint of infertility in Department of Obstetrics & Gynaecology, Acharya Shree Chander College of Medical Sciences and Hospital, Sidhra Jammu from July 2013 to July 2014. HSG findings were compared with laparoscopic findings. The sensitivity, specificity, positive predictive value (PPV) and negative predictive value (NPV) of HSG were calculated. **Results** The mean age of the patients was 33 years. Sixty five (65%) cases were having primary infertility 35 (35%) had secondary infertility. Fifty nine patients (43%) had infertility of 5–10 years duration. The mean duration of infertility was found to be 6.46 ± 3.24 years.

Out of 100 patients, 67 (67%) showed tubal pathology on HSG and 33% showed normal findings. Out of 67 patients with tubal pathology, only 48(62.85%) had tubal pathology while 19 (28.35%) patients had no pathology on laparoscopy. So findings on hysterosalpingogram can be misleading. Out of 33 patients with normal HSG, 8 (21.2%) showed tubal disease and 11(36.36%) showed peritubal adhesions while 14 (42.42%) were normal on laparoscopy. So patients with normal HSG also show tubal disease and peritubal adhesions on laparoscopy.

Senstvity of HSG was calculated as 71.64%(59.31 to 81.99%), Specificity of 42.42% (25.48% to 60.78%), Positive predictive value of 74.64%(64.51% to 77.84%), Negative predictive value of 42.42% (29.82% to 56.09%), negative predictive value of 42.42%(29.82% to 56.09%) and accuracy of 62.00%(51.75% to 71.52%).

Conclusion Laparoscopy can be used as first line approach in detecting tubo- peritoneal factors in infertile patients. It is more effective than HSG in detecting tubal and peritoneal pathologies and in treating the pathology at the same sitting.

Keywords: Laparoscopy, Infertility, Tubo peritoneal, Hystersalpingography

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Introduction

Infertility affects about 10-15% of couples of reproductive age groups[1]. Tubo-peritoneal factors are respnosible for 30-40% of cases of infertility. The etiology of tubal damage can be intrinsic (ascending salpingitis, including salpingitis isthmica nodosa) or extrinsic (peritonitis, endometriosis and pelvic surgery). Evaluation of tubal patency represents a key step in the basic workup of infertile women[2,3]. Hysterosalpingography (HSG) is often performed as first line approach to assess tubal patency and the presence of peri-tubal adhesions as it is inexpensive and less invasive[4]. But it has number of limitations which prevent its use as a sole test for detecting tubal factors. Number of new diagnostic tests have come up but laparoscopy with direct visualization of the pelvic anatomy has shown promise to diagnose tubal and peritoneal abnormalities[5]. The objective of this study was to prove that laparoscopy has better diagnostic value than HSG in detecting tubo-peritoneal factors in infertile patients.

Material and Methods

The present study was conducted on 100 patients who presented with complaint of infertility in Department of Obstetrics & Gynaecology, Acharya Shree Chander College of Medical Sciences and Hospital, Sidhra Jammu from July 2013 to July 2014. Thorough history and examination of both the partners was carried out. Routine investigations, transvaginal ultrasonography, semen analysis and HSG were carried out in patients with infertility of more than one year. HSG was done on 8-10th day of the cycle. Tablet Doxycycline 100mg and Inj, Hyoscine were given about one hour prior to test. Two films were taken. Uterine contour and tubal patency were analysed while conducting the test. Reporting was also done by radiologist. All patients showing unilateral or bilateral block were subjected to diagnostic and therapeutic laparoscopy and all the HSG findings were compared with laparoscopic findings. Those patients with normal HSG who did not conceive in 3 months time were also subjected to laparoscopy.

Results

The mean age of the patients was 33 years. Sixty five (65%) cases were having primary infertility 35 (35%) had secondary infertility. Forty three patients (43%) had infertility of less than 10 years duration. The mean duration of infertility was found to be 6.46 ± 3.24 years. (Table 1)

Out of 100 patients, 67 (67%) showed tubal pathology on HSG and 33% showed normal findings. Out of 67 patients with tubal pathology, 46 had unilateral tubal pathology and 21 had bilateral tubal.(Table 2)

Out of 46 patients with unilateral tubal pathology on HSG, 16(34.78%) patients had no tubal pathology, 17(36.95%) had unilateral tubal pathology while 13(28.2%) showed bilateral pathology on laparoscopy. (Table 3)

Out of 21 patients with bilateral pathology, 3(14.28%) had no tubal pathology, 1(4.76%) had unilateral pathology and 17 (80.95%) showed bilateral pathology. (Table 4)

Out of 33 patients with normal HSG, 7 (24.24%) showed tubal disease, 11(33.36%) showed peritubal adhesions and 14 (42.42%) showed no pathology. (Table 5)

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Out of 67 patients with tubal pathology on HSG, no pathology was seen in 19(28.35%). However 48 patients (28.25%) showed tubal pathology on laparoscopy. Out of 33 patients with normal HSG, 19(57.57%) patients showed tubal pathology while 14(42.42%) showed no pathology. (Table 6)

Sensitivity, Specificity, Positive Predictive value and Negative predictive value of HSG were 71.64%. 57.57%,71.64% and 57.57%. (Table 7)

TABLE 1

GENERAL CHARACTERISTICS OF PATIENTS

Age	Numbers	Percentage
20-25	10	10
25-30	31	31
30-35	47	47
>35	12	12
Type of Infertility		
Primary	65	65
Secondary	35	35
Years of Infertility		
<10	43	43
>10	57	57

Table 2
HSG Findings

Findings	Number	Percent
Normal	33	33
Unilateral tubal pathology	46	46
Bilateral tubal pathology	21	21

Table 3

LAPAROSCOPIC FINDINGS IN CASES WITH UNILATERAL PATHOLOGY ON HSG

		HSG		
Laparoscopic Findings	**Obstruction**	**Hydrosalpinx**	**Peritubal adhesions**	**Total**
No tubal pathology	7(33.33)	0	9(45)	16 (34.78)

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Unilateral tubal pathology				
Obstruction	6(28.57)	0	0	6(13.04)
Hydrosalpinx	0	1(20%)	0	1(2.17%)
Adhesions	1(4.76)	0	5(25%)	6(13.04%)
Combinations	1(4.76)	1(20%)	2(10%)	4(8.69%)
Bilateral tubal pathology				
Obstruction	3(14.28)	0	0	3(6.52%)
Hydrosalpinx	1(4.76)	2(40%)	0	3(6.52%)
Adhesions	1(4.76)	0	2(10%)	3(6.52%)
Combinations	1(4.76)	1(20%)	2(10%)	4(8.69%)
Total	21	5	20	46

Table 4

Laparoscopic findings in cases with bilateral pathology on HSG

		HSG Findings		
Laparoscopic Findings	**Obstruction**	**Hydrosalpinx**	**Adhesions**	**Total**
No tubal pathology	1(7.1)	0	2(50%)	3(14.28%)
Unilateral pathology				
Obstruction	1(7.1)	0	0	1(4.76)
Hydrosalpinx	0	0	0	
Adhesions	0	0	0	
Combinations	0	0	0	
Bilateral tubal pathology				
Obstruction	11(78.57%)	0	0	11(52.38%)
Hydrosalpinx	0	2(66.66)	0	2(9.52%)
Adhesions	0	0	2(50%)	2(9.52%)
Combinations	1(7.1%)	1(33.34%)	0	2(9.52%)
Total	14	3	4	21

Table 5

Laparoscopic findings in patients with normal HSG

Findings	**Number(33)**	**Percent**
No pathology	14	42.42

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Peritubal adhesions		33.33
Unilateral	7	
Bilateral	4	
Tubal Disease		
Unilateral	3	9.09
Bilateral	5	15.15

Table 6

	Laparoscopy	
HSG	**True Positives 48**	**False positives 19**
	False Negative 19	**True Negatives 14**
	Total 67	**Total 33**

Table 7

Sensitivity, specificity, Positive Predictive value and Negative Predictive Value of HSG

Statistics	**Value**	**95% CI**
Sensitivity	**71.64%**	**59.31%to81.99%**
Specificity	**42.42%**	**25.48% to60.78%**
Positive Predictive Value	**71.64%**	**64.51% to77.84%**
Negative Predictive Value	**42.42%**	**29.82% to 56.09%**
Accuracy	**62.00%**	**51.75% to 71.52%**

Discussion

In our study of 100 patients, 67 (67%) showed tubal pathology on HSG and 33% showed normal findings. Out of 67 patients with tubal pathology, only 48(62.85%) had tubal pathology while 19(28.35%) patients had no pathology on laparoscopy. In present study, HSG demonstrated sensitivity of 71.64% and Specificity of 42.42% with positive predictive value of 71.64% and negative predictive value of 42.42%. Although HSG is often performed as a first line approach for the assessment of tubal patency and the presence of adhesions, but accurate assessment of tubal status and pelvis cannot be obtained by HSG alone. HSG has its own limitations. There are

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several reports that have documented the shortcomings of HSG if not followed by laparoscopy. A meta-analysis conducted by Swart et al. in 1995 in Netherlands compared 20 published studies involving approximately 4,100 patients. They reported a comparative HSG sensitivity of 65% and specificity of 85% when compared tolaparoscopy with chromopertubation. They further concluded that the diagnosis of peritoneal adhesions based on HSG findings was unreliable and advised caution when assuming proximal tubal occlusion or "cornual block," which may be secondary to transient tubal spasms (20% of cases) or collections of amorphous debris or minimal adhesions (40% of cases) (Swart et al., 1995)[6]. In Saudi Arabia in 2008 in a similar study done by Sakar et al., the sensitivity and specificity of HSG were 63%and 89.3%, and the positive predictive value was 92%, with a 55% negative predictive value, and the accuracy ratio was 72%[7].So correct assessment of tubal status and pelvis should be made by laparoscopy which allows direct visualization of pelvis. Tanahatoe et al suggested that laparoscopy is mandatory after abnormal HSG findings in work-up prior to any treatment[8]. Even patients with normal HSG also showed intrinsic tubal pathology in 21.2% and peritubal adhesions in 36.36 on laparoscopy. Even when laparoscopy was performed for infertile patients with normal HSG findings, tubal pathology was detected in 6.0~34.0% (Al-Badawi et al. 1999[9]; Corson et al. 2000[10]; Capelo et al. 2003[11]; Tanahatoe et al. 2003; Tsuji et al. 2009[12]). So it is necessary to evaluate thefallopian tubes by laparoscopy as diagnosis and therapeutic interventions canbe done at the same sitting.[13]It has also been estimated that using laparoscopy as a standard test of tubal function would reduce the apparent incidence of unexplained infertility from 10 to 3.5%.[13] so laparoscopy should be considered as first line diagnostic procedure in evaluating tubalinfertility.

Conclusion

For evaluation of tubal and peritoneal factors laparoscopy can be used as first line diagnostic test. Although HSG is cost effective method for tubal evaluation but its limitation in detection of tubal and peritoneal causes makes it less effective in comparison to laparoscopy. Laparoscopy also has additional advantage of treatment of endometriosis, peritoneal adhesions, cysts, and uterine pathologies.

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