

## Role of Laparoscopy, SSG and HSG in the Diagnosis of Tubal Factors of Infertility

Swati Bansal<sup>1</sup>, Mukesh Mittal<sup>2\*</sup>

<sup>1</sup>Senior Specialist, Gynaecology & Obstetrics, Zanana Hospital, SMS Medical College, Jaipur, Rajasthan, India.

<sup>2\*</sup>Assistant Professor, Department of Radiodiagnosis, SMS Medical College, Jaipur, Rajasthan, India.

### ABSTRACT

**Background:** Female infertility is a condition of a woman who in ordinary favorable circumstances for breeding adds not even one to the population or produces no living or viable child. Hysterosalpingography gives information mainly about uterine cavity and patency of fallopian tubes. The present study was conducted with the aim to determine the role of laparoscopy, SSG and HSG in the diagnosis of tubal factors of infertility.

**Materials and Methods:** The present study was conducted in the Department of Gynae & Obst, SMS Medical College, Jaipur on 50 cases of both primary and secondary infertility attending Gynae OPD. A complete history and medical evaluation of all the subjects was performed. Complete hemogram, urine examination and ECG of subjects were obtained. Sonosalpingography and HSG were performed amongst the subjects. HSG was considered normal if both fallopian tubes filling normally and free intra-abdominal spill of contrast medium without pocket formation was seen. All the results obtained were arranged in a tabulated form and analyzed using SPSS software. False positive and true positive values were obtained.

**Results:** The present study was conducted with 50 females, out of which majority was residents of urban area and belonged to middle class. There were 54% females between 25-29 years of age. In this study results were expressed as positive when there was fluid in pouch of douglas indicating patency of either one of tube and negative when there was no

fluid in pod after instillation indicating block. Out of 18 cases showing block, 13 cases truly predicted the blockage of tubes (i.e. True positive) whereas 5 cases were wrongly not showing free spill due to peritubal adhesion or tubal spasm. 22 cases were found to have blocked tubes were true positive and no case was found as false negative, here by sensitivity of laparoscopy is 100% and specificity is also 100%.

**Conclusion:** From the above study, our study it can safely be concluded that diagnostic laparoscopy is ideal for evaluation of tubal factors in infertility work up and it should be done in all patients of infertility.


**Keywords:** Hemogram, Infertility, Laparoscopy.

### \*Correspondence to:

**Dr. Mukesh Mittal,**  
Assistant Professor,  
Department of Radiodiagnosis,  
SMS Medical College, Jaipur, Rajasthan, India.

### Article History:

**Received:** 30-11-2017, **Revised:** 25-12-2017, **Accepted:** 14-01-2018

Access this article online	
Website: <a href="http://www.ijmrp.com">www.ijmrp.com</a>	Quick Response code 
DOI: 10.21276/ijmrp.2018.4.1.124	

### INTRODUCTION

Childlessness may be a tragedy to the married women and can be a cause of marital upset as well as personal unhappiness and ill health. Infertility is a source of personal misery. It is regarded as a disgrace, as a mark of divine displeasure, as ground for divorce and women is labeled as Banjh which is a social stigma.

Mathews Duncan (1871)<sup>1</sup> defined female infertility as the condition of a woman who in ordinary favorable circumstances for breeding adds not even one to the population or produces no living or viable child. The incidence of infertility both primary and secondary varies from 2-10% of all married couples.<sup>2</sup> The nearly irreversible core of infertile patient is like to be below 3%. Rindfleisch (1910) first observed that uterine cavity can be visualized roentgenographically by injection of watery paste of

bismuth by syringe into the uterus.<sup>3</sup> Authors used Collargol for this purpose first of all. In 1914 Cary demonstrated tubal patency of the tubes by making use of this silver salt collargol.<sup>4</sup>

Hysterosalpingography gives information mainly about uterine cavity and patency of fallopian tubes. To certain degree knowledge about conditions outside the tube may also be obtained. It is a simpler OPD Procedure and requires no anesthesia and gives permanent record and has a pleasant therapeutic effect.

In SSG & HSG, a false negative result can be due to tubal spasm or cornual plugging with endometrium. The present study was conducted with the aim to determine the role of laparoscopy, SSG and HSG in the diagnosis of tubal factors of infertility.

## MATERIALS AND METHODS

The present study was conducted in the Department of Gynae & Obst, SMS Medical College, Jaipur on 50 cases of both primary and secondary infertility attending Gynae OPD. Females trying to conceive at least for 1 year between the age group of 20-40 years were included in the study. Females using contraceptives, presence of male factor for infertility, hernias or bowel obstruction were excluded from the study. Subjects with recent history of epilepsy, active tuberculosis of genital tract, recent active salpingitis were also excluded from the study. All the subjects were informed about the study and a written consent was obtained from all in their vernacular language. The study was approved by institutional ethical board. A complete history and medical evaluation of all the subjects was performed. Complete

hemogram, urine examination and ECG of subjects were obtained. Sonosalpingography and HSG were performed amongst the subjects. HSG was considered normal if both fallopian tubes filling normally and free intra-abdominal spill of contrast medium without pocket formation was seen. If both the tubes filled but no spill occurred, distal tubal block was diagnosed. If the passage of contrast medium was arrested proximal to the fimbrial end, diagnosis of interstitial block was considered. Failure of contrast medium to spread freely within peritoneal cavity after spill or pocketing was interpreted as peritubal or pelvic adhesions. For performing laparoscopy general anesthesia was used. All the results obtained were arranged in a tabulated form and analyzed using SPSS software. False positive and true positive values were obtained.

**Table 1: Accuracy of SSG in Detecting Tubal Patency**

Results	No of Blocked Tube at Laparoscopy		No of Patent Tube at Laparoscopy		SSG Results	
No Free Fluid In POD	12	32.43%	5	13.51%	17	45.94%
Free Fluid In POD	0	-	20	54.05%	20	54.05%
<b>Total</b>	<b>12</b>	<b>32.43%</b>	<b>25</b>	<b>67.56%</b>	<b>37</b>	<b>100%</b>

**Table 2: Accuracy of HSG in Detecting Tubal Patency**

Results	No of Blocked Tube at Laparoscopy		No of Patent Tube at Laparoscopy		HSG Results	
No Peritoneal Free Spill	13	46.42%	5	17.85%	18	64.28%
Free Spill	0	-	10	35.71%	10	35.71%
<b>Total</b>	<b>13</b>	<b>46.42%</b>	<b>15</b>	<b>53.57%</b>	<b>28</b>	<b>100%</b>

**Table 3: Accuracy of Diagnostic Laparoscopy in Detecting Tubal Patency**

Results	No of Blocked Tube		No of Patent Tube		Total	
Chromopertubation Negative	22	44%	0	-	22	44%
Chromopertubation Positive	0	-	28	56%	28	56%
<b>Total</b>	<b>22</b>	<b>44%</b>	<b>28</b>	<b>56%</b>	<b>50</b>	<b>100%</b>

## RESULTS

The present study was conducted with 50 females, out of which majority was residents of urban area and belonged to middle class. There were 54% females between 25-29 years of age.

Table 1 shows the accuracy of SSG in detecting tubal patency. In this study results were expressed as positive when there was fluid in pouch of douglas indicating patency of either one of tube and negative when there was no fluid in pod after instillation indicating block. SSG showed tubal patency in 20 cases. All of these were true negative. Out of 17 cases showing blocked 12 cases were truly predicted the blockage of tube (i.e. True positive) whereas 5 cases were wrongly not showing free fluid in pod due to peritubal adhesion or tubal spasm (i.e. false positive) here by sensitivity of SSG is 100 % and specificity of SSG is 80 %

Table 2 shows the accuracy of HSG in detecting tubal patency. In this study results were expressed as positive when there was free spill of contrast in peritonium. Out of 18 cases showing block , 13 cases truly predicted the blockage of tubes (i.e. True positive) whereas 5 cases were wrongly not showing free spill due to peritubal adhesion or tubal spasm (i.e. false positive) here by sensitivity of HSG is 100 % and specificity of HSG is 66%.

Table 3 shows the accuracy of diagnostic laparoscopy in detecting tubal patency. In this study results were expressed as positive when there was free spill of dye seen bilaterally or unilaterally and

negative when there was no intraperitoneal spill of dye is seen i.e. Blocked tubes out of 50 cases studied, laparoscopy showed positive results i.e. Patency of either one of tube in 28 cases and all of these contributing to true negative. Like HSG/SSG no case was found to be false positive by laparoscopy. 22 cases were found to have blocked tubes were true positive and no case was found as false negative, here by sensitivity of laparoscopy is 100 % and specificity is also 100%.

## DISCUSSION

Mean age of the patient in our study was 25 .83 yrs. for primary infertility and 29 .93 years for secondary infertility. Samuel E Brown<sup>5</sup>; Charles C. Coddington et al (2000)<sup>6</sup> calculated mean age of infertility 34.1 yrs, patients age ranged between 21 yrs and 44 yrs. Our findings does not coincide with this because they had taken wide age group in their studies i.e. up to 44 yrs and mean age is less in our study may be due to early marriages in the population studied. As the time passes during unsuccessful spontaneous attempts, fecundability is further compromised by increase in age and decreasing ovarian reserves.<sup>7</sup> Couples need to be aware that there is a normal time requirement to achieve pregnancy. In each ovulatory cycles normal couples have only about a 30% chance of becoming pregnancy.<sup>8</sup> According to the present study, HSG has detected abnormality more frequently

(71.42%) than SSG (54.05%) than laparoscopy (44%). Mahajan et al (1994)<sup>9</sup> showed 26% blocked tubes and 74% patent tubes by SSG and 28% blocked and 72% patent tubes by HSG.

Heikkinen H et al (1995)<sup>10</sup> studied the tubal patency by SSG and diagnostic laparoscopy and found that in SSG 73% tubes were found to be patent and 26% were found to be occluded. In diagnostic laparoscopy 82% were patent and 18% were blocked. The false negative result in SSG & HSG indicates that these are not as accurate as laparoscopy in diagnosing bilateral cornual occlusion.

Our study coincide with Mahajan et al (1994)<sup>9</sup> who showed in their study that tubal occlusion (bilateral) in SSG was in 12 cases (46.15%) and in HSG it was in 16 cases (57.14%). Peritubal adhesions were present in 2 cases showing abnormal SSG. These 2 cases contribute to false negative results by SSG. In present study, sensitivity of the SSG was found to be 100%. Specificity of SSG in our study was 80%.

In present study, sensitivity of the HSG was found to be 100%. Specificity of HSG in our study was 66%. In present study, sensitivity of the laparoscopy was found to be 100%. Specificity of laparoscopy in our study was 100%. Our study shows that sensitivity of SSG, HSG and laparoscopy was 100% but specificity of laparoscopy was more than SSG & HSG. This coincide with Randolph et al (1986)<sup>11</sup> who in their study done comparison of real time ultrasonography, HSG and diagnostic laparoscopy in evaluation of tubal patency. He found that ultrasonography was accurate (sensitivity 100% and specificity 91%) as HSG (sensitivity 96%, specificity 94%) in demonstrating the presence of tubal patency.

Randolph et al (1986)<sup>11</sup> studied 61 patients by real time USG as an alternative to HSG in the evaluation of uterine abnormality and tubal patency immediately before hysteroscopy / laparoscopy. USG showed sensitivity of 100% and specificity of 91% in demonstrating the tubal patency but less accurate in establishing which tube was patent.

Allahbadia GM (1992)<sup>12</sup> evaluated in his study that there was 92.59% agreement i.e. patency or occlusion of the fallopian tube when the results of their test were compared with those of HSG and laparoscopic chromopertubation. Mahajan et al (1994)<sup>9</sup> in the study of 100 infertile women found sensitivity of 100% and specificity of 94.74%, by HSG in demonstrating the presence of tubal patency.

Sehlfief et al (1972)<sup>13</sup> have showed in their study with B-mode scanning only, sensitivity was 88% for the right tube and 90% for the left tube; specificity was 100% for each tube. Mitri et al (1991)<sup>14</sup> found in their study that sonographic and BSG findings were similar in 82% of the women with respect to uterine assessment and in 72% with respect of tubal findings.

Tufekci et al (1992)<sup>15</sup> showed in their study obtained from transvaginal SSG and laparoscopy were completely consistent for 29 cases (76.32%) and partially consistent for 8 cases (21.05%).

## CONCLUSION

From the above study, our study it can safely be concluded that diagnostic laparoscopy is ideal for evaluation of tubal factors in infertility work up and it should be done in all patients of infertility, because without laparoscopy it is difficult to make a fair assessment of tubal factor in infertility.

## REFERENCES

- Duncan JM. Fecundity, Fertility, Sterility, and Allied Topics. A. and C. Black; 1871.
- Menon MK; Ksishna; Devi PK; Bhaskar K : Infertility -Postgraduate Obstetrics and Gynaecology Fourth Edition. 1991, 339-53.
- Rindfleisch W. Darstellung des cavum uteri. Klin Wochenschr. 1910 Apr;47:780.
- Campbell AM, Miller JD, Menees TO, Holly LE. The diagnostic value of radiopaque contrast media in gynecology and obstetrics. American Journal of Obstetrics and Gynecology. 1932 Oct 1;24(4):542-52.
- Brown SE, Coddington CC et al. Evaluation of outpatient hysteroscopy, saline infusion hysterosonography, and hysterosalpingography in infertile women: a prospective, randomized study. Fertility and sterility. 2000 Nov 1;74(5):1029-34.
- Burkman LJ, Coddington CC et al. The hemizona assay (HZA): development of a diagnostic test for the binding of human spermatozoa to the human hemizona pellucida to predict fertilization potential. Fertility and sterility. 1988;49(4):688-97.
- Novak ER. Ovulation after fifty. Obstetrics & Gynecology. 1970 Dec 1;36(6):903-10.
- Speroff L, Fritz MA, editors. Clinical gynecologic endocrinology and infertility. lippincott Williams & wilkins; 2005.
- Singh KB, Mahajan DK, Wortsman J. Effect of obesity on the clinical and hormonal characteristics of the polycystic ovary syndrome. The Journal of reproductive medicine. 1994 Oct;39(10):805-8.
- Heikkinen H, Tekay A, Volpi E, Martikainen H, Jouppila P. Transvaginal salpingosonography for the assessment of tubal patency in infertile women: methodological and clinical experiences. Fertility and sterility. 1995 Aug 1;64(2):293-8.
- Randolph JR, Ying YK, Maier DB, Schmidt CL, Riddick DH. Comparison of real-time ultrasonography, hysterosalpingography, and laparoscopy/hysteroscopy in the evaluation of uterine abnormalities and tubal patency. Fertility and sterility. 1986 Nov 1;46(5):828-32.
- Allahbadia GN. Fallopian tubes and ultrasonography: the Sion experience. Fertility and sterility. 1992 Nov 1;58(5):901-7.
- Emschermann P. Loxokalypus socialis gen. et sp. nov. (Kamptozoa, Loxokalypodidae fam. nov.), ein neuer Kamptozoentyp aus dem nördlichen Pazifischen Ozean. Ein Vorschlag zur Neufassung der Kamptozoensystematik. Marine Biology. 1972 Feb 1;12(3):237-54.
- Mitri FF, Andronikou AD, Perpinyal S, Hofmeyr GJ, Sonnendecker EW. A clinical comparison of sonographic hydrotubation and hysterosalpingography. BJOG: An International Journal of Obstetrics & Gynaecology. 1991 Oct 1;98(10):1031-6.
- Tüfekçi EC, Girit S, Bayırlı E, Durmuşoğlu F, Yaltı S. Evaluation of tubal patency by transvaginal sonosalpingography. Fertility and sterility. 1992 Feb 1;57(2):336-40.

**Source of Support:** Nil.

**Conflict of Interest:** None Declared.

**Copyright:** © the author(s) and publisher. IJMRP is an official publication of Ibn Sina Academy of Medieval Medicine & Sciences, registered in 2001 under Indian Trusts Act, 1882. This is an open access article distributed under the terms of the Creative Commons Attribution Non-commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

**Cite this article as:** Swati Bansal, Mukesh Mittal. Role of Laparoscopy, SSG and HSG in the Diagnosis of Tubal Factors of Infertility. Int J Med Res Prof. 2018 Jan; 4(1):575-77. DOI:10.21276/ijmrp.2018.4.1.124