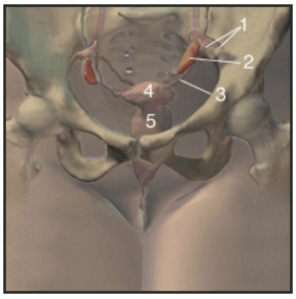
ORIGINAL PROF-911

HYSTEROSALPINGOGRAPHY



DR. USMA NAILA, MBBS, MCPS, FCPS.
Department of Gynaecology/Obstetrics
Combined Military Hospital
Jhelum Cantonment

ABSTRACT... drusmanaila@yahoo.com **Objective:** To assess the diagnostic accuracy of Hysterosalpingography in determining tubal patency in cases of sub fertility. **Design:** Prospective analytical study. **Setting:** Department of Gynaecology and obstetric Combined Military Hospital Multan in collaboration with Radiology department. **Population:** One hundred sub fertile women in their reproductive age having sub-fertility greater than 36 months or less than it, if maternal age was greater than thirty years or there was history of pelvic pain or abnormal pelvic findings. **Period:** May 2003 – April 2004. **Material & Methods:** One hundred patients underwent Hysterosalpingography in follicular phase followed by laparoscopic chromopertubation in secretory phase in next cycle. **Results:** Hysterosalpingography and laparoscopy were successfully performed in 100% of cases. Full concordant findings from two procedures were obtained in 80% of cases for tubal blockade. Evaluation of clinical efficacy of Hysterosalpingography regarding tubal patency showed a sensitivity of 91%, specificity 74.2% with positive predictive value 64.5% and negative predictive value 94%. On the other hand a low sensitivity of Hysterosalpingography was obtained regarding peri-tubal adhesions. Both the procedures were free of major complications. Incidence of minor complication was 17% for laparoscopy and 18% for Hysterosalpingography. **Conclusion:** Because of high sensitivity, Positive Predictive Value and reasonably good concordance rate of Hysterosalpingography with laparoscopy, it should remain an integral part of female sub-fertility work-up. Although it cannot replace laparoscopy but it can be used as first line screening investigation of tubal patency irrespective of duration of sub-fertility.

Key Words: Hysterosalpingography, Laparoscopic Chromopertubation, Tubal patency testing.

INTRODUCTION

Tubal factor counts for 14% cases of female subfertility[1], but in our setup probability of its incidence is higher due to inadequate and inappropriate health facilities.

The assessment of patency of the fallopian tube is an essential part of any sub-fertility work up. The confirmation of tubal patency does not necessarily mean that they are of normal functions[2] .

Presently Hysterosalpingography and laparoscopy are the most commonly used techniques and many new are being introduced[3].

World Health Organization (WHO) studies reflected that laparoscopy identifies tubal patency better than Hysterosalpingography but both modalities are less than ideal in accurate identification of tubal status[4]. Different studies have led to the conclusion that laparoscopy should directly be used as first line investigation of tubal patency testing if duration of sub-fertility is greater than 36 months. Pakistan is a third world country where health facilities are neither up to the mark nor these are uniform through out the country. Only a few centers are equipped with laparoscopy facilities and expertise is even further limited, although the wide range of investigative techniques are available for tubal patency testing but none of them has proved to be ideal. The routine examination procedures are expensive, time consuming and unpleasant for the patient[5]. Current methods involve use of surgery, anaesthesia and hospital admission. There is desperate need of a test which should be non-invasive, accurate with minimum side effects and which can work in limited facilities[6].

MATERIALS & METHODS

One hundred sub-fertile women irrespective of type of sub-fertility reporting to gynae out patient department of Combined Military Hospital Multan from May 2003 to April 2004, who failed to attain conception after three years of unprotected coitus or earlier if they had positive pelvic findings or maternal age was greater than 30 years were enrolled for this study. These women were between ages of 20 to 40 years and had BMI ranging from 20–35 kg/m^2 husbands had normal semen analysis report. Their ovulation was confirmed with serum progesterone level.

All the hundred patients underwent hystero-salpingography and laparoscopy. An informed consent for Hysterosalpingography and laparoscopy was obtained and possible complications of the procedures were also explained. Hysterosalpingography was done under strict aseptic conditions in follicular phase using water based contrast medium; Urograffin and Leech Wilkinson cannula was used for injecting contrast medium[7]. Contrast medium was injected gently under control of image intensifier[8]. All patients were pre-medicated with Tablet Mefenamic Acid half hour before the procedure and Capsule Doxycycline and Mefenamic Acid were given for three days after the procedure. X-rays with documented opinion of radiologist were handed over to patients.

Laparoscopy was done in secretory phase under general anaesthesia with strict aseptic conditions[9]. Systematic and detailed inspection of abdomen and pelvis was performed.[11] Ancillary probe was passed suprapubically. Chromopertubation was done by injecting dilute Methylene blue dye. Passage of dye was observed through the fimbrial ends. After completion of procedure incision was repaired with vicryl suture. Injectable analgesic and antibiotic were given for twelve hours followed by oral treatment for five days. All patients were kept in hospital for 24 hours for observation of vital signs and any possible complications. Detailed report of procedure was handed over to patients.

RESULTS

Evaluation of this study highlighted following facts.

One hundred women took part in this study. Out of these 15% were 20–24 years of age, 31% were 25–29 years, 52% were 30–34 years and 2% were 35-39 years of age.

Distribution of results of Hysterosalpingography and Laparoscopy regarding tubal status

Forty-eight out of one hundred patients found to have blocked tubes on Hysterosalpingography. Out of these forty-eight blocked tubes thirty-one cases were confirmed to have blocked tubes on Laparoscopy. So false positive results of Hysterosalpingography were found in 17 patients. While three tubes patent on Hysteros-alpingography had severe peritubal adhesions on Laparoscopy, so 03 patients showed false negative results on Hysterosalpingography. Loculated spillage of contrast medium was seen in 07 cases, which is an

evidence of pelvic adhesions.

Table I Ages of the patients		
Age in years	**BMI (kg/m2)**	**Parity in secondary sub fertility**
15% (20-24)	5% (20-22)	11% (01)
31% (25-29)	22% (23-	51% (02)
52% (30-34)	62% (26-28)	05% (03)
02% (35-39)	11% (29-31)	-

Table II Pelvic pathology detected on HSG		
Pathology	**No. of patients**	**% Age**
Fibroid	04	4%
Congenital abnormality	02	2%
Adhesions + PID	07	7%

Out of forty-eight blocked tubes twenty-four were bilaterally blocked, sixteen had right sided blockage and eight had left sided blockage. While on Laparoscopy total blocked tubes were 34, bilaterally blocked were 20, right tubes 9 and left tubes 5. Out of 17 blocked tubes, which were not confirmed on Laparoscopy.

Table III Pelvic pathology detected on laparoscopy		
Pathology	**No. of patients**	**% Age**
Fibroid	07	7%
Congenital abnormality	03	3%
Adhesions + PID	18	18%
Endometriosis	03	3%
PCOS	05	5%
Ovarian Mass	02	2%

Table IV.			
Investigation method (Hysterosalpingography)		**Reference method (Laparoscopic chromopertubation)**	
HSG	Blocked tubes	a (31)	b (17)
	Patent tubes	c (3)	d (49)
	Total	34	66
Sensitivity		$\frac{31}{31+03}$ X 100=91%	
Specificity		$\frac{49}{49+17}$ X 100=74.2%	
Positive predictive value		$\frac{31}{31+17}$ X 100=64.5%	
Negative predictive value		$\frac{49}{03+49}$ X 100=94.2%	
Concordance		$\frac{31+49}{31+17+3+49}$ X 100=80%	
True positive = a = 31, False Positive = b= 17, False Negative = c= 03, True Negative= d= 49			

Figure-2. HSG findings according to patency of fallopian tubes

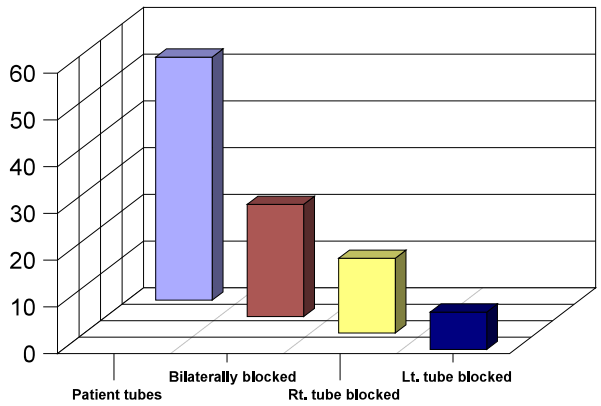
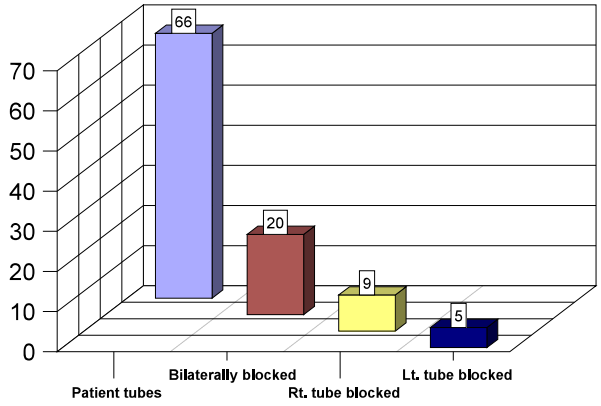


Figure-2. Laparoscopic findings according to patency of fallopian tubes



12 had proximal occlusion, Peritubal pelvic adhesions were noticed in 18 cases on Laparoscopy. 34 tubes found to be blocked on Laparoscopy out of these 31 were confirmed on Hysterosalpingography.

On Hysterosalpingography submucosal fibroids were found in 04 cases, congenital abnormalities were detected in 02 cases while evidence of pelvic adhesions were found in 07 cases.

Hysterosalpingography:

True Positive (TP) = 31,
False Positive (FP) = 17,
True Negative (TN) = 49,
False Negative (FN) = 03,

Distribution of results of Hysterosalpingography and Laparoscopy regarding pelvic pathologies.

While on Laparoscopy pelvic adhesions were diagnosed in 18 cases, fibroid in 07 patients, congenital abnormalities 03, Endometriosis 03, PCOS 05 and ovarian mass in 02 cases.

No major complication was observed in Hysterosalpingography and Laparoscopy. However minor complications were observed in 18% cases in Hysterosalpingography and 17% cases in Laparoscopy.

DISCUSSION

We evaluated Hysterosalpingography through a local prospective study in order to assess its role in tubal patency and also calculated its sensitivity, specificity, positive and negative predictive value while using laparoscopy as a reference test in all cases. Our aim was to find out usefulness of Hysterosalpingography in evaluating tubal factor of sub-fertility and whether it can safely serve us as a first line investigation of tubal patency in all cases of sub-fertility regardless of its duration and resorting to laparoscopy only once problem is identified on Hysterosalpingography.

Several studies have been conducted to evaluate Hysterosalpingography, but very few of them were local studies and most of them were retrospective. Sample size had also been planned to kept optimum in order to ensure valid results. Many comparative studies had been conducted between Hysterosalpingography and laparoscopy to evaluate tubal factor of sub-fertility.

Comparative study concluded by M. Tankova et al[12] between Hysterosalpingography and Laparoscopy revealed agreement between the result of both methods

in 66.4% of cases while in our study results of Hysterosalpingography agreed with results of laparoscopy in regard to tubal status in 82.45% of cases[2].

Dhaliwal et al[13] carried out a similar study to assess the value of Hysterosalpingography in diagnosing tubal patency and peritubal adhesions. Agreement between findings of Hysterosalpingography and laparoscopy was present in 59.87%[13] of cases, while in our study the agreement between two procedures were 82.45%. This difference may be due to fact that in our study 100% patients underwent both Hysterosalpingography and laparoscopy, while in their study laparoscopy was done in 50% of cases.

Meta analysis by Magurinen D S. et al[14] of fourteen study involving 2473 participants compared the findings of Hysterosalpingography and laparoscopy. They found 80.2% agreement between the two procedures. The positive predictive value of tubal patency was 80% for Hysterosalpingography compared with laparoscopy and 84% of laparoscopy compared with Hysterosalpingography. Results of our study closely resembled this Meta analysis. Our study revealed 82.45% agreement between two procedures. Positive predictive value of Hysterosalpingography was 64.5% and positive predictive value of laparoscopy was 91% while negative predictive of Hysterosalpingography and laparoscopy were 94% and 74.2% respectively.

A comparative study was carried out by R. Tahir and S. Javed[15], They evaluated sonohysterosalpingography as a preliminary test of tubal patency in investigation of sub fertility and compared this technique with conventional Hysterosalpingography and laparoscopy. While comparing results of sonohysterosalpingography with Hysterosalpingography/laparoscopy, there was complete agreement in 92% of cases and partial agreement in 8% cases having unilateral tubal blockage.

In our study we did not use sonohysterosalpingography for tubal patency testing because of our limited resources, above all results of Hysterosalpingography were satisfactory showing high concordance rate with laparoscopy. However it is possible in some cases sonohysterosalpingography may replace Hysterosalpingography in order to select women with patent tubes who may be suitable for further sub-fertility treatment without having more invasive investigations.

Whether laparoscopy, Hysterosalpingography or sonohysterosalpingography will improve the outcome for the patients without imposing extra risks due to false positive and false negative results? The final measure remains a randomized controlled trial.

CONCLUSION

The good concordance rate of Hysterosalpingography with laparoscopy proves that it should remain an integral part of female initial sub fertility work up though it cannot replace laparoscopy.

On basis of high sensitivity and positive predictive value, it is recommended that Hysterosalpingography should be placed as first line screening investigation of tubal patency irrespective of duration of sub fertility in third world countries like Pakistan where facilities and expertise for laparoscopy are not wide spread.

REFERENCES

1. Hall M G R, Glazener C M A, Kell J. **Population study of causes, treatment and outcome of infertility.** B M J 1985; 201: 1693-7.

2. Sterk T, Wurfel W, Becker W, Albert P J. **Serial Scinitgraphic imaging for visualization of passive transport processes in the human fallopian tube.** Hum Reprod 1991; 6: 1156-89.

3. Brown S E, Coddington C C, Schnoor J, Tanne J P, Gibbons W, Ochninger S. **Evaluation of outpatient hysteroscopy, saline infusion hysterosonography and Hysterosalpingography in the infertile women.** Fertil-Sterl 2000 Nov; 74 (5): 1029-34.

4. Cook I D. Infertility. In: Edmonds D K. editor. **Dewhurst's Textbook of Obstetrics and Gynaecology for Postgraduates. 6th ed. London:** Black Science; 1999.432-34.

5. Dessole S, Meloni G B, Capobianco G, Manzoni M A, Aambrosini G, Canalis G C. **A second Hysterosalpingography reduces the use of selective technique for treatment of a proximal tubal obstruction.** Fertil-Steril 2000; 73(5): 1037-.

6. **Hysterosalpingography. In:** Ahmad Naseem editor. **Basic Concepts In Infertility Male and Female.** 1st ed. Karachi: Sanober; 1998. 143-4.

7. Tur K I, Seidman D S, Soriano, Greenberg J, Dor J, Bider D. **Hysterosalpingography with a ballon catheter versus metal Cannula:** Hum Repord 1998; 133:75-77.

8. Hamiliton J A, Larson A J, Lower A M, Hasnain S, Grudzinskas J G. **Evaluation of the performance of hysterosalpingosynography in 500 consecutive unselected infertile women.** Hum-Reprod 1998 Jun; 13(6): 1519-26.

9. Opsahl M S. **Outcome of pregnancy after laparoscopy chromotubation during cycles of conception: a report of three cases.** Obstet Gynecol 1994 May; 83(5): 902-3.

10. Hulka J F, Reich H. **Text book of laparoscopy.** 2nd ed. Philadelphia: W B Saunders; 1994. 41-.

11. Imtiaz S, Zafar F, Shaukat A. **Laparoscopic findings in infertility.** Am K E Medcioll 1999; 5(1): 93-4.

12. Tankova M, Nalbanski B, Bolisa B L, Borisov S. **A. comparative study between Hysterosalpingography in evaluating female infertility.** Obstet-Gynaecol. 2000; 39 (1): 20-0.

13. Dhaliwal K, Gupta L R, Aggarwal K N. **Is Hysterosalpingography an important tool in modern gynaecological practice.** Int-. Fertil-Women-Med 1999 Jun-Aug; 44 (4): 212-5.

14. Magurinen D S, Djashunbakch O, Grudzuiskas J G. **Assessment of the fallopian tube. Obstet-Gynaecol.** 1992; 47: 587-603.

15. Rana T, Siddiqui J. **Comparative study of sonohysterosalpingography, Hysterosalpingography, and chromolapascopy.** British Journal of Obstet and Gynaecology. 1996; 9 (1): 17-22.