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Comparative study of hydrotubation, Sonosalphingography, Hysterosalphingography and diagnostic laproscopy for evalution of tubal patency in infertile women

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Abstract
Objectives: This study was done to compare Hydrotubation, Sonosalphingography, Hysterosalphingography and Diagnostic laproscopy for evalution of tubal patency in infertile women.
Methods: 50 women with primary and secondary infertility attending OPD of Obst and gyn department S. M. S. M. C, Jaipur from May 2016 to April 2017 underwent Hydrotubation and Sonosalphingography on day 7of menstrual cycle and on Hysterosalphingography on day 9 and DL on 21/22 day of the same or next menstrual cycle.
Results: For evalution of tubal patency, Hydrotubation has sensitivity 84.61% and specificity of 95.12%. SSG had sensitivity of 91.67% and specificity of 97.50% for evalution of tubal patency. In contrast,in HSG for evalution of tubal patency, the sensitivity is 78.57% and specificity is 92.85%.
Conclusion: Hydrotubation appears to be inexpensive, non-invasive, and quick, of no risk of ionizing radiation, opd procedure and well tolerable first line diagnostic method for determining the tubal patency in infertility.

Keywords: Hydrotubation, Hysterolaproscopy, Hysterosalphingography, Sonosalphingography.

Introduction
Infertility is a major gynaecological problem. It is defined as a failure to conceive within one or more years of regular unprotected coitus [4]. The incidence of tubal disease in infertility varies from country to country. In India it has been estimated to be about 40% [1].The prevalence of pelvic inflammatory disease, genital tract tuberculosis, and chronic infection is quite common in our country; hence, the incidence of tubal factor in infertile women is high. Tuboperitoneal factors are responsible for 30-40% of female infertility [1].The anatomical patency and functional integrity of the tubes are assessed easily by Hydrotubation, Sonosalphingography (SSG), Hysterosalphingography (HSG) and Diagnostic laproscopy (DL).
The most straight forward method, and historically the first one introduced in clinical practice, was the radiological Hysterosalphingography, using a radio opaque contrast agent. It allows a very good visualization of cervical canal, endometrial cavity. It can precisely detect the side and site of block in the tube. In HSG, there is risks of radiation exposure, idiosyncracy to contrast agents and required X-ray machines. Diagnostic laproscopy (DL) is the gold standard (definitive method) for evalution of tubal factors of infertility. Main disadvantages are invasiveness of procedure, necessity of general anaesthesia and carries along the risk of surgical accidents. It cannot detect abnormality in the uterine cavity and tubal lumen. In Sonosalphingography, tubal patency is evaluated by using ultrasonography. It can detect uterine pathology. It is noninvasive, safe procedure without anaesthesia and exposure to x-ray but required sinologist and USG dependent
Last but not least is Hydrotubation which is outdoor procedure. It is noninvasive, simple and safe procedure. Main advantage of it is that not required sonologist, USG, X-ray machine and anaesthesia. In the present study, it is proposed to do a comparative study between Sonosalphingography, Hysterosalphingography, Diagnostic laproscopy and hydrotubation in infertility workup with an open mind, keeping advantages and disadvantage of this procedure in view.

Material and Methods

This is a comparative observational study done on 50 infertile women (either primary and secondary) attending Gynaecology OPD and fulfilling inclusion and exclusion criteria.This study has been done in Department of Obstetrics and Gynaecology of S.M.S Medical college from May 2016 to April 2017. Written and informed consent was obtained from all patients.

Inclusion criteria: Infertile women who are willing to participate in study after written informed consent

- Infertile women (20-35 yrs)
- Uneventful outcome of previous pregnancy, postpartum and postabortal period in patients of secondary infertilty

Exclusion criteria: Acute PID

- Immunocompromised state
- Women in whom laproscopy is contraindicated
- Infertility due to male factors.

At first visit, a detailed history of patient taken and general physical and bimanual pelvic examination done. A total of 50 cases were subjected to the comparative study. Hydrotubation, Sonosalphingography, Hysterosalphingography were done in postmenstrual phase between 7 th to 9th day of menstrual cycle. Diagnostic laproscopy was done premenstrually on 21st / 22nd day of cycle. Baseline and outcome data were compiled in Microsoft excel and analysed statistically.

Result

A total of 50 women with primary and secondary infertility were enrolled. Baseline characterstics were shown in table 1. Out of 50 patients, 39 patients related to primary infertility and 11 patients related to secondary infertility. Table 2 shows findings of each test associated with tubal patency in both primary and secondary infertile women. Table 3 shows the comparasion of each diagnostic test of infertility with their sensitivity, specificity, positive predictive value and negative predictive value.

Table 1: Distribution of cases according to infertility, religion, age wise distribution and period of infertility.

	Primary infertility	Percentage	Secondary infertility	Percentage	Total
No. of cases	39	78%	11	22%	50
Religion					
Hindu	29	58%	9	18%	38
Muslim	10	20%	2	4%	12
Age wise distribution					
20-24 yrs	15	30%	5	10%	20
25-29 yrs	12	24%	5	10%	17
30-35 yrs	12	24%	1	2%	13
Duration of infertility wise distribution					
2-5 yrs	19	38%	4	8%	23
6-10 yrs	12	24%	6	12%	18
10-15 yrs	8	16%	1	2%	9

Table 2: Comparison of Hydrotubation, Sonosalphingography, Hysterosalphingography and Diagnostic laproscopic findings.

Finding	Hydrotubation		Sonosalphingography		Hysterosalphingography		Diagnostic laproscopy	
	No. of cases	%	No. of cases	%	No. of cases	%	No. of cases	%
B/L Tubal patency	37	74%	38	76%	36	72%	39	78%
B/L Cornual block	6	12%	2	4%	3	6%	2	4%
B/L Fimbrial block	0	0%	2	4%	2	4%	2	4%
U/L Cornual block	7	14%	4	8%	3	6%	2	4%
U/L Fimbrial block	0	0%	4	8%	6	12%	5	10%

Table 3: Comparasion of Hydrotubation, Sonosalphingography and Hysterosalphingography in terms of Sensitivity, Specificity, Positive Predictive Value, Negative Predictive Value.

	Hydrotubation	Sonosalphingography	Hysterosalphingography
Sensitivity	84.61%	91.67%	78.57%
Specificity	95.12%	97.50%	92.85%
Positive Predictive Value	84.61%	91.67%	78.57%
Negative Predictive Value	95.12%	97.50%	92.85%

Conclusion

Tubal evaluation is essential in infertile patients. Hystosalphingography and Sonosalphingography has been used for a long time for assessment of tubal patency. In detection of tubal patency, Hydrotubation appears to be inexpensive, noninvasive, and quick, of no risk of ionizing radiation, simple OPD procedure and well tolerable first line diagnostic method for determining the tubal patency in Infertility. It is evident from above study that Hydrotubation have high Sensitivity, Specificity, Positive Predictive value and negative predivtive value as compared to Hystosalphingography.

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