

Original Research

Assessing tubal patency using Magnetic resonance hysterosalpingography

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ABSTRACT:

Background: Infertility is the inability to achieve pregnancy after one year or more of unprotected regular sexual intercourse. The present study was conducted to assess utility of MR HSG in detecting tubal patency in female infertility.

Materials & Methods: 48 cases of primary or secondary infertility were subjected to MR HSG followed by cHSG during the preovulatory period. If tubes were blocked, the patients were subjected to DL in the next menstrual cycle. **Results:** Out of the 48 patients, 22 patients had tubal blocks and 26 patients had bilateral patencies. Of the 22 patients, 17 patients had bilateral blocks and 5 patients had unilateral blocks. Among the 20 patients with secondary infertility, 6 patients had, 10 patients had history of tubectomy or tubal ligation reversal and 4 patients had infertility due to unidentified causes.

Conclusion: Magnetic resonance hysterosalpingography found to be effective in Tubal patency assessment.

Key words: Magnetic resonance hysterosalpingography, Tubal patency, female infertility

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INTRODUCTION

Infertility is defined by the World Health Organization as the “inability to achieve pregnancy after one year or more of unprotected regular sexual intercourse”.¹ The global prevalence of primary infertility is about 2% and secondary infertility is 3%. Causes of infertility include male factors, ovulatory dysfunction, uterine abnormalities, tubal obstruction, peritoneal factors, or cervical factors.² A history and physical examination can help direct the evaluation. Men should undergo evaluation with a semen analysis.³ Abnormalities of sperm may be treated with gonadotropin therapy, intrauterine insemination, or in vitro fertilization. Ovulation should be documented by serum progesterone level measurement at cycle day 21. Evaluation of the uterus and fallopian tubes can be performed by hysterosalpingography in women with no risk of obstruction. For patients with a history of endometriosis, pelvic infections, or ectopic pregnancy, evaluation with hysteroscopy or laparoscopy is recommended.⁴

HSG, the radiographic technique used in the evaluation of uterus and fallopian tubes, is the first line of investigation in the evaluation of tubal factors in infertility. MR HSG is a novel technique used in

evaluating tubal patency. Having the inherent advantage of MR in imaging the pelvis, MR HSG is an innovative tool for female infertility evaluation. MR HSG may be used as a one-stop investigation tool in detecting uterine, ovarian, and tubal pathologies.⁵ The present study was conducted to assess utility of MR HSG in detecting tubal patency in female infertility.

MATERIALS & METHODS

The present study comprised of 48 cases of primary or secondary infertility. Written informed consent was obtained from all enrolled subjects.

The examination was done on Day 7–Day 12 of the menstrual cycle. All the patients were advised to abstain from sexual intercourse during the days after menstruation till the day of procedure so as to avoid any chance of pregnancy during the procedure. The patient was given oral combination of ofloxacin and metronidazole three times a day as premedication starting on the day before and continued two days post procedure. The patients were subjected to MR HSG followed by cHSG during the preovulatory period. If tubes were blocked, the patients were subjected to DL in the next menstrual cycle. If the tubes were patent

and there was failure of conception, they were thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant.

RESULTS

Table I Type of infertility

Infertility	MR HSG tubal block		Patent	Total
	Unilateral	Bilateral		
Primary	0	6	22	28
Secondary	5	11	4	20
Total	5	17	26	48

Table I, Graph I shows that out of the 48 patients, 22 patients had tubal blocks and 26 patients had bilateral patencies. Of the 22 patients, 17 patients had bilateral blocks and 5 patients had unilateral blocks.

Graph I Type of infertility

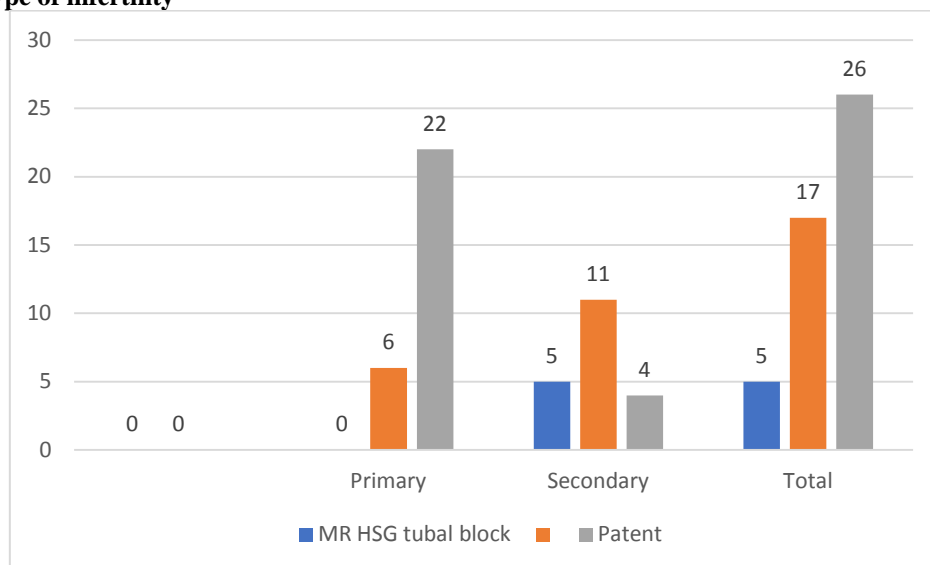
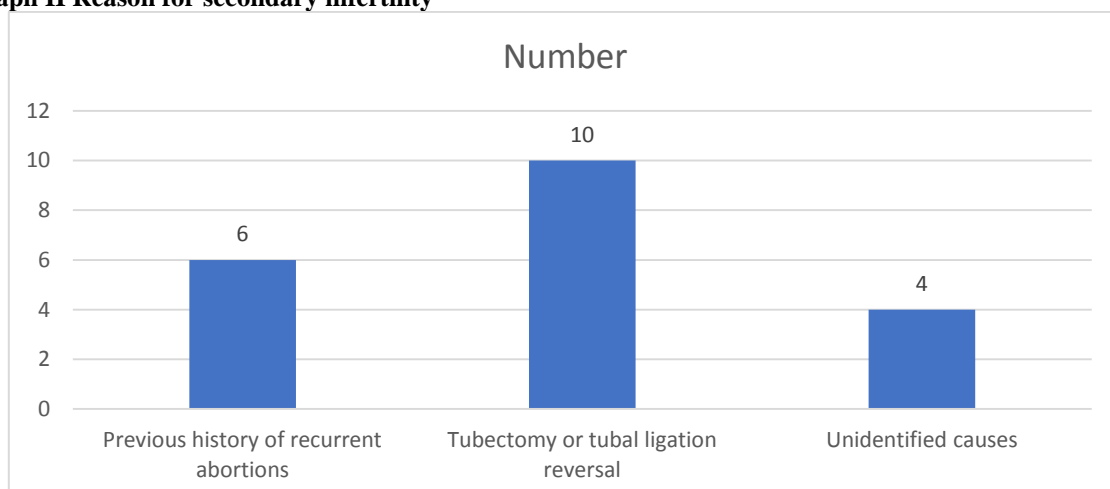


Table II Reason for secondary infertility

Reason	Number	P value
Previous history of recurrent abortions	6	0.01
Tubectomy or tubal ligation reversal	10	
Unidentified causes	4	

Table II, graph II shows that among the 20 patients with secondary infertility, 6 patients had, 10 patients had history of tubectomy or tubal ligation reversal and 4 patients had infertility due to unidentified causes. The difference was significant (P < 0.05).

Graph II Reason for secondary infertility



DISCUSSION

The potential causes of female infertility are numerous and may involve the fallopian tubes, peritoneum, endometrium, uterus, cervix, and ovaries as well as age and lifestyle.⁶ Tubal pathology is one of the main anatomical causes of infertility and is estimated to account for 30–40% of cases.⁷ Imaging evaluation plays a crucial role in the diagnostic work-up of female infertility, and a multimodality approach is usually required for identifying the causes and guiding clinical management. Initial gynecologic evaluation includes assessment of the ovulatory function and transvaginal ultrasonography (TVUS) examination⁸. As tubal occlusion is the most common anatomical cause of female infertility, imaging evaluation of tubal patency is considered the gold standard before any fertility treatment.⁹ The present study was conducted to assess utility of MR HSG in detecting tubal patency in female infertility.

In present study, out the 48 patients, 22 patients had tubal blocks and 26 patients had bilateral patencies. Of the 22 patients, 17 patients had bilateral blocks and 5 patients had unilateral blocks. Cipolla et al¹⁰ assessed the feasibility of 3.0 Tesla magnetic resonance (3.0T MR) hysterosalpingography and its role in the diagnostic work-up of female infertility and to evaluate if this fast “one-stop-shop” imaging approach should be proposed as a first-line examination. A total of 116 infertile women were enrolled in this prospective study; all underwent 3.0T MR hysterosalpingography. After standard imaging of the pelvis, tubal patency was assessed by acquiring 3D dynamic time resolved T1-weighted (T1W) sequences during manual injection of 4–5 mL of contrast solution consisting of gadolinium and normal sterile saline. The examination was successfully completed in 96.5% of cases, failure rate was 3.5%. Dynamic sequences showed bilateral tubal patency in 64.3%, unilateral tubal patency in 25.9%, and bilateral tubal occlusion in 9.8%. Extratubal abnormalities were found in 69.9% of patients. Comprehensive analysis of morphological and dynamic sequences showed extratubal abnormalities in 43.1% of patients with bilateral tubal patency.

We found that among the 20 patients with secondary infertility, 6 patients had, 10 patients had history of tubectomy or tubal ligation reversal and 4 patients had infertility due to unidentified causes. Jagannathan et al¹¹ assessed the diagnostic accuracies of dynamic MR HSG and conventional HSG (cHSG) in identifying tubal patency in women with infertility using diagnostic laparoscopy (DL) as gold standard in 40 patients. The patients were subjected to MR HSG followed by cHSG during the preovulatory period. If tubes were blocked, the patients were subjected to DL in the next menstrual cycle. If the tubes were patent and there was failure of conception, they were subjected to DL in the interval of 3 months. Twenty-four patients had bilateral tubal spill which was confirmed using cHSG and DL. One patient had

discordant MR HSG and cHSG results and six patients had discordant MR HSG and DL results. No statistical difference was observed between MR HSG and cHSG.

Winter et al¹² in their study 27 out of 33 patients had bilateral tubal patencies and 1 out of 6 patients had bilateral block which were confirmed using laparoscopy. In the same study, tubal catheterization was done in two patients and in three of the remaining six patients with bilateral tubal blocks, neither cHSG nor laparoscopy could be done.

CONCLUSION

Authors found that Magnetic resonance hysterosalpingography found to be effective in Tubal patency assessment.

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