

Research Article**Diagnostic Accuracy of Saline Infused Sono Salpingography
in Fallopian Tube Blockage**

¹Abdul Raouf, ²Aamna Gilani, ³Asma Shaukat,
⁴Adeela Abid and ⁵Javaria Ashraf

¹Senior Registrar, Allied Hospital, Faisalabad Medical University

²PG Trainee, Allied Hospital, Faisalabad Medical University

³PG Trainee, Allied Hospital, Faisalabad Medical University

⁴PG Trainee, Allied Hospital, Faisalabad Medical University

⁵PG Trainee, Sheikh Zayed hospital Rahim Yar Khan

ABSTRACT

Objective; To determine the diagnostic accuracy of saline infused Sonosalpingography (SSG) in cases with fallopian tube blockage and taking conventional Hysterosalpingography (HSG) gold standard

Material and methods; This cross sectional validation study was done during August 2017 to March 2018 at Department of Radiology, Services Hospital, Lahore. In the present study 100 females with age range of 18-40 years with suspected tube related factors, irrespective of duration and type (primary/secondary) infertility were included. The cases with male related factor and those with hormonal issues were excluded from the study. Then these cases underwent Saline infused Sonosalpingography followed by conventional HSG preferably on next day. The diagnosis of tubal blockage was made where there was absence of spillage of dye.

Results; In this study there were total 100 cases. The mean age of the participants was 33.41 ± 4.89 years and the mean duration of infertility was 4.31 ± 0.98 years. There were 11 (11%) cases with previous history of abdominal surgery, 34 (34%) had history of abortion and 22 (22%) cases that had prior history of IUCD. There were 61 (61%) cases that had primary infertility. Tubal obstruction was seen in 61 (61%) cases on HSG and 60 (60%) on SSG. The sensitivity of SSG for tubal obstruction was 70.49%, PPV was 70.49% and diagnostic accuracy was 64% with $p = 0.01$.

Conclusion; Saline infused Sonosalpingography has shown significantly better results in diagnostic accuracy for tubal blockage.

Key words; Infertility, tubal blockage, SSG, HSG

INTRODUCTION;

Infertility is defined as the failure to conceive after 1 year of regular un-protected inter-course. It has been seen to affect the 10-15% of the pairs across the globe due wide range of reasons and pose a great sexual, psychological and social pressure on these couples and can result in depressive and emotionally broken morals.¹

Both male and female factors can cause this and only single entity as male related issues seen in around 20% of infertility cases but it can be a partial factor in around 30% to 40% of cases; hence female related factors are by far the most common cause of infertility.²⁻³

Regarding female related factors, the most

common ones are due to hormonal changes, including ovulation issue or anatomical factors like issues with the uterus, ovaries or fallopian tubes alongwith previous surgeries leading to adhesion formation. Tubal factors are very common due to its blockage and need to be investigated. The tests to diagnose this have shown variable accuracies. Conventional hysterosalpingogram is the most widely deployed technique in the past and Saline infused sonosalpingography is the new modality with good diagnostic accuracies to guide for further management steps.⁴⁻⁵

Objective;

To determine the diagnostic accuracy of saline infused Sonosalpingography (SSG) in cases with fallopian tube blockage and taking conventional Hysterosalpingo-graphy (HSG) gold standard

METHODOLOGY;

Study design: Cross sectional validation study.
Study Setting: Department of Radiology, Services Hospital, Lahore
Duration of Study: August 2017 to March 2018

MATERIAL AND METHODS:

In the present study 100 females with age range of 18-40 years with suspected tube related factors, irrespective of duration and type (primary/secondary) infertility were included. The cases with male related factor and those with hormonal issues were excluded from the study. Then these cases underwent Saline infused Sonosalpoinography followed by conventional HSG preferably on next day. The

Table No 01. Demographics of study subjects

	Mean	Range
Age (years)	33.41±4.89	18-40
Weight (kg)	57.11±10.73	33-102
Duration of infertility (years)	4.31±0.98	1-10

Table No 02. Diagnostic accuracy of SSG in tubal blockage (n= 100)

Obstruction on SSG	Obstruction on HSG		p value
	Yes	No	
Yes	TP 43	FP 18	p= 0.01
No	FN 18	TN 21	

TP= True positive TN= True negative FN= False negative FP= False positive
 Sensitivity= 70.49%
 Specificity= 53.85%
 PPV= 70.49%
 NPV= 53.85%
 Accuracy= 64%

DISCUSSION

One of the major causes of infertility is blockage of the fallopian tubes. In the investigation and treatment of infertility, it is important to establish that the tubes are patent. This is necessary because any treatment, such as induction of ovulation and artificial insemination, given without making sure that the tubers are patent may be a futile effort.

diagnosis of tubal blockage was made where there was absence of spillage of dye.

Statistical analysis;

The data was entered and analysed by using SPSS-23. Post stratification chi-square test was applied and $p \leq 0.05$ was taken as significant.

RESULTS;

In this study there were total 100 cases. The mean age of the participants was 33.41±4.89 years and the mean duration of infertility was 4.31±0.98 years (table 01). There were 11 (11%) cases with previous history of abdominal surgery, 34 (34%) had history of abortion and 22 (22%) cases that had prior history of IUCD. There were 61 (61%) cases that had primary infertility. Tubal obstruction was seen in 61 (61%) cases on HSG and 60 (60%) on SSG. The sensitivity of SSG for tubal obstruction was 70.49%, PPV was 70.49% and diagnostic accuracy was 64% with $p= 0.01$ (table 02).

In the present study majority of the cases 61 (61%) were found to be having primary infertility. These findings were consistent with the studies done by Sudha,⁶ Rahman and Sinha,⁷ and Allahbadia⁸ et al, where they also found primary infertility as more common. The reason can be due to higher number of cases seeking medical attention in those with no live issue as compared to the ones who had either

one or more previous baby i.e. secondary infertility.

Tubal obstruction was seen in 61 (61%) cases on HSG and 60 (60%) on SSG. The sensitivity of SSG for tubal obstruction was 70.49%, PPV was 70.49% and diagnostic accuracy was 64% with $p= 0.01$ These findings were comparable to previous study with slighter lower accurate results by a study done by Dasan TA et al.⁹ In their study as compared to HSG, the sensitivity, specificity, positive predictive value, and negative predictive values (NPVs) of SIS in detecting tubal patency were 94.28%, 75%, 97.05%, and 50%, respectively.

The sensitivities of SIS in diagnosing tubal patency were similar to other studies, Inki *et al.*¹⁰ (90.2%), Deichert *et al.*¹¹ (89%), whereas the specificities obtained were slightly higher Deichert *et al.*¹¹ (100%) as compared to the present study (66.66%)

In another study they focused on correlation between SSG and HSG for establishment of tubal patency in a study by Madhok R et al and it was observed that there was 92.3% agreement (Kappa value = 0.923, Standard error = 0.437, 0.95 CI = 0.8373-1) between SSG and HSG which suggests that SSG is at least similar to or slightly better to HSG in its effectiveness for evaluating tubal patency.¹²

CONCLUSION;

Saline infused Sonosalpingography has shown significantly better results in diagnostic accuracy for tubal blockage.

REFERENCES;

1. Moore KL, Persaud TVN. The Developing Human: Clinically Oriented Embryology. 5th ed. Philadelphia, Pa: WB Saunders; 1993.
2. Colburn GL. The anatomy of the fallopian tube. Siegler AM, ed. The Fallopian Tube: Basic Studies and Clinical Contributions. Mount Kisco, NY: Futura Publishing; 1986. 3-11.
3. Moore KL. Clinically Oriented Anatomy. 3rd ed. Baltimore, Ma: Williams & Wilkins; 1992.
4. Beryth U, Mor-Yosef S. Ovum pickup.

- Siegler AM, ed. The Fallopian Tube: Basic Studies and Clinical Contributions. Mount Kisco, NY: Futura Publishing; 1986. 147-64.
5. Lindblom B, Norstrom A. The smooth-muscle architecture of the human fallopian tube. Siegler AM, ed. The Fallopian Tube: Basic Studies and Clinical Contributions. Mount Kisco, NY: Futura Publishing Company; 1986. 13-20.
6. Prasad S. Tubal evaluation by Transvaginal sonosalpingography - A comparative study. *Ob gyne today* 1999;4:2.
7. Rahman M, Sinha DK. A cost effective approach in the evaluation of female infertility. *J ObstetGynecol India* 2002;52:105-7.
8. Allahbadia GN. Fallopian tubes and ultrasonography: The Sion experience. *FertilSteril*1992;58:901-7.
9. Dasan T A, Basawaraj N G. A comparative study of saline infused sonohysterography and conventional hysterosalpingography in the evaluation of female infertility. *West Afr J Radiol*2016;23:124-9
10. Inki P, Palo P, Anttila L. Vaginal sonosalpingography in the evaluation of tubal patency. *Acta Obstet GynecolScand*1998;77:978-82.
11. Deichert U, Schlieff R, van de Sandt M, Daume E. Transvaginal hysterosalpingo-contrast sonography for the assessment of tubal patency with gray scale imaging and additional use of pulsed wave Doppler. *FertilSteril*1992;57:62-7.
12. Madhok R, Taneja V. Role of sonosalpingogram in correlation to hysterosalpingogram in assessment of infertility. *Int J Reprod, Contracept, Obstet Gynecol.* 2016;5(6):1936-43.