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ORIGINAL ARTICLE

SONOSALPINGOGRAM (SSG) – AS A SAFE ALTERNATIVE TO HYSTEROSALPINGOGRAM (HSG) IN EVALUATING FEMALE INFERTILITY

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ABSTRACT: AIMS: The study is done to determine the sensitivity of SSG in detecting the tubal patency and intrauterine abnormalities in subfertile women in comparison with HSG. **METHODS AND MATERIAL**: The study is done in 53 patients of 20-32 years age group with infertility, we tried to evaluate all these patients with HSG as well as SSG done by two radiologists separately. However, SSG could not be done in 3 patients for various reasons. The findings of HSG and SSG interpreted by two radiologists separately and tallied later. **STATISTICAL ANALYSIS USED**: Compared sensitivity of two tests, positive predictive values and kappa study to determine degree of agreement between two tests. **RESULTS:** Conclusions: SSG is almost equally sensitive to HSG In evaluating tubal patency. SSG Is best in evaluating intrauterine abnormalities. And thus, SSG is a Safe reliable alternative for HSG in the evaluation of patients with infertility with no hazards of radiation and contrast reactions. By doing SSG we can avoid radiation to the extent of 3.2 Msv, which is average radiation dose given by HSG.MRI, a non-radiation modality, can replace HSG in the evaluation of uterine anomalies.
KEYWORDS: SSG, HSG, female infertility, tubal patency, endometrial lesions.

INTRODUCTION: Infertility is defined as the failure to achieve a clinical pregnancy after 12 months or more of regular unprotected sexual intercourse. Out of all the infertility cases female factors contribute for one-third, male factors for another one-third, and the remaining third by both male and female factors or for unexplained reasons[1]. Major contributors of female factors for infertility are a) ovarian pathology – 30-40%, b) tubal pathologies – 25-30%, c) uterine and cervical causes -15% d) PCOD -10%And e) unexplained causes -5%, approximately[2].

So far, hysterosalpingogram is used as gold standard for the evaluation of tubal and uterine causes of infertility[3]. HSG carries the risk of radiation and the side effects of contrast used. This study is done to find out an effective alternative to evaluate tubal and uterine causes of infertility without inherent risk of radiation and contrast material. Sonosalpingography is done with sterile saline injection under transvaginal ultrasound guidance to evaluate intracavitory lesions and tubal morphology and patency.[4]

Small endometrial lesions like polyps, synechiae, and endometritis could be picked up in SSG better than the other investigative modalities. The saline flow and spill while injecting can be recorded and reviewed later for better interpretation.

SUBJECTS AND METHODS: The study is done in 53 patients of 20-32 years age group with infertility; we tried to evaluate all these patients with HSG as well as SSG done by two radiologists separately. However, SSG could not be done in 3 patients for various reasons. The findings of HSG and SSG interpreted by two radiologists separately and tallied later.

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The HSG is done during 5th to 9th day of the cycle after screening for a possible pregnancy. IV Buscopan is given 30 minutes prior to the procedure to avoid tubal spasm. The procedure is done with either Leech Wilkinson's cannula or a soft rubber catheter depending upon the status of endocervical canal and os. We used 1:1 diluted non-ionic contrast media for HSG[4]. In few patients, HSG is done first followed by SSG by two radiologists separately and in others SSG is done first followed by HSG. The saline and contrast injections are given through the same catheter/ cannula in situ without repeating the traumatic procedure of cannulation.

In patients of uterine anomalies detected in HSG/SSG are evaluated by a follow up MRI on PHILLIPS 1.5 tesla machine.

During the procedure of SSG, the flow and spill of each tube are studied by giving two separate injections with 10ml saline per injection. The intracavitory and tubal flow, spill from both the tubes, are recorded and reviewed by a second radiologist.

A broad spectrum antibiotic and pain killer is given after the procedure routinely. No major complications are observed except for minimal bleeding in the patients with unhealthy cervix,
In these 3 patients SSG could not be done after HSG for the same

RESULTS:

Table 1(a): Findings of HSG and SSG in tubal &uterine cavities evaluation:

FINDINGS

	TOTAL	HSG	SSG	MRI
NORMAL TUBES	71 among 99tubes(71.7%)	71 (71.7%)	70 (70.7%)	-
BLOCKED TUBES	28 among 99tubes(28.2%)	28 (28.2%)	29 (29.2%)	-
INTRA UTERINE ABNORMALITIES	13 among 50 cavities (26%)	02 (4%)	13 (26%)	-
UTERINE ANAMOLIES	12 among 50 cavities (24%)	12 (24%)	02 (4%)	12 (24%)

TABLE 1(b): Sensitivity and positive predictive values of SSG calculated in comparison with HSG [2]:

	SENSITIVITY	POSITIVE PREDICTIVE VALUE
NORMAL TUBES	98.5%	100%
TUBAL BLOCK	100 %	96.5%

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In our study, in evaluating tubal patency KAPPA Value is 0.97, which means that there is almost perfect agreement between 2 tests. Hence by opting for SSG, we can avoid radiation and contrast hazards.

TABLE 1(c): Sensitivity of HSG and SSG in detecting intrauterine anomalies[5]:

	SENSITIVITY
SSG	100%
HSG	15.3%

In evaluating intrauterine abnormalities KAPPA Value is 0.21, which means that there is fair agreement between the two tests.

As HSG got low sensitivity for detection of intrauterine abnormalities we prefer SSG as a better option as it also avoids hazards of radiation.

DISCUSSION: We have taken up 53 patients of infertility (primary and secondary) between 20 to 32 years of age and evaluated for possible endometrial and tubal factors by doing HSG & SSG. However, SSG could not be done in 3 patients because of unhealthy cervix, as they are bleeding with HSG. Thus, both HSG and SSG could be done in 50 patients evaluating 50 uterine cavities and 99 tubes. (One patient with unicornuate uterus).

HSG and SSG are done one after the other by two Radiologists and interpreted separately. The findings are evaluated later by the two radiologists. The aim of the study is to evaluate the patients of infertility without the inherent hazards of Radiation and Contrast material.

Both HSG and SSG are almost equal in their sensitivity in picking up normal tubes and the spill. No spill could be shown on SSG in one tube where free spill could be seen on HSG and hence taken as normal tube. All the blocked tubes are equally detected by HSG and SSG.

Figure 1 (A): HSG - bicornuate uterus & HSG - right hydrosalpinx with bilateral tubal block:

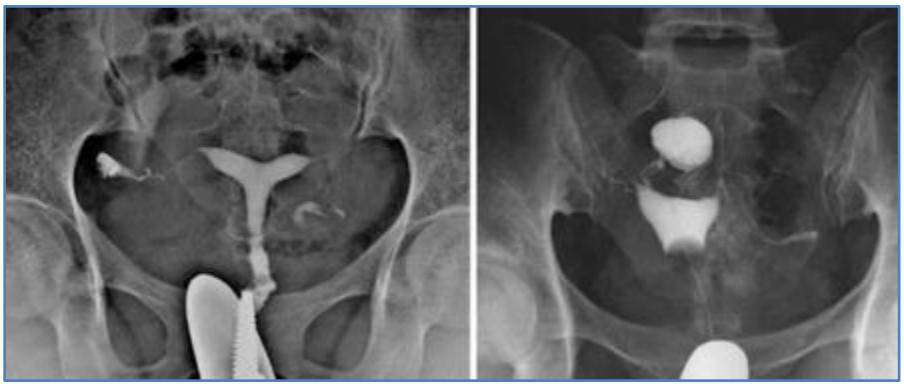

Figure 1 (A)

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Figure 1 (B): HSG - bicornuate uterus & MRI - bicornuate uterus:

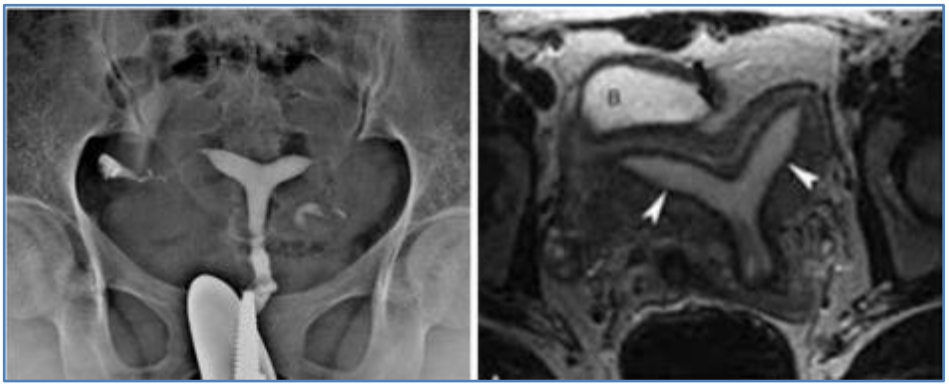

Figure 1 (B)

Figure 1 (C): SSG - endometrial synechiae & SSG - endometrial polyp:

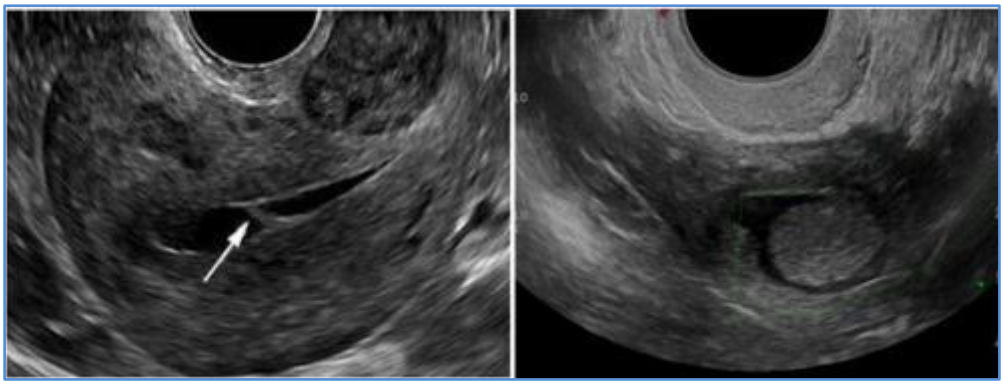

Figure 1 (C)

In our study we have detected 13 intrauterine abnormalities (like, uterine synechiae, endometrial polyps) by SSG. HSG could pick up only 2 out of 13 intrauterine abnormalities. So, for demonstration of intrauterine abnormalities, SSG is safe and far better than HSG.

We came across 12 uterine anomalies which are picked up by HSG and only 2 could be made out by SSG. Later a screening MRI was done in all these patients and MRI could pick up all the 12 anomalies.

Though SSG is poor in picking up uterine anomalies, MRI is an equally good alternative with no hazards of radiation and contrast material.

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