SONO HYSTEROSALPINGOGRAPHY (SHSG): A USEFUL ADJUVANT IN INFERTILITY EVALUATION

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ABSTRACT: AIMS & OBJECTIVES: To assess the value of transvaginal Sono hysterosalpingography in evaluating the uterine abnormalities and tubal patency in infertile patients and to compare its results with established methods like hysterosalpingography and laparoscopy. **MATERIALS & METHODS:** Starting from June 2010, 30 cases of transvaginal Sono hysterosalpingography (SHSG) were carried out on patients of infertility and reproductive wastage. The results of this procedure were compared with HSG in 14 cases and with laparoscopy in 16 cases. In cases where uterine factor was suspected the findings of sonohysterogram were confirmed by office hysteroscopy. **RESULTS:** Out of the 16 cases confirmed by laparoscopy there was complete agreement with SHSG in 14 (87.5%) cases partial agreement in one (6.25%) and total disagreement in 2 (12.5%) cases out of The 14 cases (85.7%) partial agreement in 1 (7.1%) And total disagreement in 2 cases (14.2%). There was 100% agreement in this findings of sono hysterosalpingography and hysteroscopy. **CONCLUSION:** There were no false positive cases in SHSG. We than conclude from our study that transvaginal SHSG is a simple & reliable method of evaluating uterine abnormalities and tubal patency its results being comparable to the established methods like HSG and laparoscopy.

KEYWORDS: Sonosalpingography, tubal patency, hysterosalpingography, SHSG, Laparoscopy.

INTRODUCTION: Evaluation of female genital tract is an important part of work up of infertility in woman. The most commonly used methods for this purpose are laparoscopy, which is invasive, and HSG which exposes the patient to ionizing radiation. Patients fear of anesthesia, surgery or radiation exposure & the objective risks of intervention often delay the testing of tubal patency and this approach may lead to long periods of expensive attempts at treatment with ovulation inducing drugs before the patient is finally referred to a hospital for tubal diagnosis. This calls for a low risk method that would be suited for ambulatory application. In our study we have attempted to evaluate the utility of SHSG.

MATERIALS AND METHODS:

Sonohysterosalpingography was performed on 50 subjects of infertility on an outpatient basis. The inclusion criteria were:

A) Unknown Tubal Function:

i)	Evaluation of tubal factor prior to ovulation induction	(20)
ii)	Past history of PID,	(3)
	Salpingectomy,	(3)
	Cystectomy,	(2)

ORIGINAL ARTICLE

B) Status after Tubal Surgery Past H/O Infertility Surgery:

- i) Laparoscopic surgery (7)
- ii) Microsurgery (4)

C) Evaluation of Uterine Factor:

- i) Recurrent pregnancy wastage (7)
- ii) Intrauterine adhesions on TVS. (4)

Procedural Details: Informed written consent was taken. The patient was given intramuscular atropine (0.6mg), tetanus toxoid (0.5mg) half an hour before the procedure. Under total aseptic precaution a baseline TVS-USG was performed after which size 8 foleys catheter was introduced in the endocervical canal and the balloon was inflated with 1 ml sterile water. 10-40 ml of normal saline was injected in a pulsatile fashion through the Foleys catheter.

The uterine distention was observed. Sonohysterogram was considered normal if the distended endometrial cavity failed to reveal any distortion. The adnexal regions and the pouch of douglas was examined. Tubes were considered patent if there was forward flow of saline for at least 5 seconds, fimbrial turbulence, fluid in culdesac were considered as presence of tubal patency (Fig 1-4).

SHSG was performed during the follicular phase. If the patient required diagnostic laparoscopy, it was performed premenstrual in the same cycle or a hysterosalpingography was performed the next day during the follicular phase.

In 20 of these subjects the findings were confirmed by HSG and in the remaining 30 they were confirmed by laparoscopy. In all patients where uterine cavity showed some abnormality, an office hysteroscopy was performed in the same sitting.

RESULTS: Out of 50 subjects studied, 32 were cases primary infertility and 18 of secondary infertility. The uterine findings are compared in Table-1.

In all cases of sonohysterography with uterine abnormality an office hysteroscopy was performed in the same sitting. In our study, there was 100% agreement between the finding of sonohysterography and hysteroscopy.

Among the 20 cases compared with HSG, 18 had similar findings by both methods and in 2 cases 2 intramural fibroids seen on SHG were reported as normal uterus on HSG.

Particulars	HSG	SHG
Normal	14	12
Submucous fibroids	1	1
Other fibroids	0	2
Septate Uterus	3	3
Intrauterine Adhesions	2	2
Total	20	20

Table 1: Comparison of Uterine Assessment

ORIGINAL ARTICLE

In the 20 cases of sonohysterosalpingography confirmed by HSG, Regarding the tubal patency, there was complete agreement with HSG in 80% (16) cases, partial agreement in 15% (3) cases and total disagreement in 1(5%) case (Table-II)

Particulars	HSG	SHG	-Complete Agreement-80%(16) -partial agreement 15%(3) -total disagreement 5%(1)
Bilateral hydrosalpinx	7	8	
(a) Spill	5	4	
(b) No Spill	2	4	
Hydrosalpinx & cornual	2	1	
Block			
Bilateral cornual block	1	2	
Bilateral free spill	10	9	
Table 2: Comparison of Tubal Patency with HSG			

In the 30 cases of sonohysterosalpingography confirmed by laparoscopy, there was complete agreement in 27 (90%) cases, partial agreement in 2 (6.6%) cases and total disagreement in 1 (3.3%) case (Table-III).

Particulars	SSG	Laparo- scopy	-Complete Agreement-27%(90) -partial agreement 2(6.6%) -Total disagreement 1(3.3%)
Bilateral hydrosalpinx	11	11	
(a) Spill	9	8	
(b) No Spill	2	3	
Hydrosalpinx & cornual	1	2	
Block			
Bilateral cornual block	4	2	
Bilateral free spill	14	15	
Table 3: Comparison of Tubal Patency with Laparoscopy			

No serious side effects were observed during and after the TVSO sonohysterosalpingography. While performing the procedure 11 patients complained of tolerable lower abdominal pain but no medication was required for the same.

The time required for the procedure ranged from 6 to 12 minutes with a mean value of 7.3 minutes.

The volume of saline injected was 10-40 ml with a mean value of 26 ml.

In one patient there was a false positive result in patient tubes on sonosalpingography but blockage on laparoscopy. In this case there was very large hydrosalpinx and the turbulence of flow of saline through the dilated tubes simulated spillage on USG screen.

In two patients false negative results were elicited, tubes were blocked on sonosalpingography but patent on laparoscopy. This may be due to tubocornual spasm, mucous plugs blocking the tubes and technical or human error.

ORIGINAL ARTICLE

DISCUSSION: Rubin (1920) introduced the tubal insufflations test using CO₂ to investigate tubal patency. Subsequently HSG became widely used especially after the introduction of water soluble contrast media. Laparoscopy is considered to be most reliable method assessing tubal patency but is an invasive procedure.

The normal fallopian tube is a poor sonic reflector devoid of the defined interfaces that produce a clear organ outline. To overcome these limitations we used a transvaginal probe with high frequency. And used normal saline to outline the tubes uterine cavity

The transabdominal sonographic evaluation of tubal patency was first reported by Richmann et al⁽¹⁾ with special intrauterine catheter & Hyskon as medium (1984).

In 1986, Randolph et al⁽²⁾ inserted a Rubin's cannula in the cervix, injected 200 ml isotonic saline. Patency confirmed by presence of retrouterine fluid. The process was done under general anaesthesia.

In 1988 Davison & Leeton⁽³⁾ created an artificial pelvic ascites by infusing Hartmann's solution into the peritoneal cavity of an infertile patient & this was supplemented with hydrotubation under vaginal sonography. They claimed that their method could replace HSG & laparoscopy.

In 1989, Drazen et al⁽⁴⁾ using sonographic salpingography in 14 infertile subjects reported mixed results and they opined that HSG was still a routine procedure.

Deichert et al⁽⁵⁾ used transvaginal hysterocontrastsonography. The tubes were visualized by isotonic saline and /or contrast medium SHU454. The same researchers continued their studies under general anaesthesia and compared findings with HSG & chromolaparoscopy and found that 72% cases gave completely consistent results and only 2% were inconsistent.

In a study of sonographic hydrotubation by F.F.Mitri et al,⁽⁶⁾ sonographic findings were similar to HSG findings in 82% with regard to uterine assessment and 72 % with regard to tubal findings SHSG provided additional information not obtained from HSG.

In the study by Tufeci et al,⁽⁷⁾ transvaginal sonosalpingography and laparoscopy were completely consistent for 76.3% cases and partially consistent for 21%cases.

In our study the findings of SHSG agreed with HSG findings in 90% cases with regard to uterine abnormalities & in 80%cases with regard to tubal patency.

In comparison with chromolaparoscopy complete agreement in 90% cases & partial agreement in 6.6 % cases were observed.

There was 100% agreement between findings of sonohysterography an hysteroscopy, similar to that reported previously.^(8,9)

Thus sonosalpingohysterography offers a much less invasive method of diagnosing tubal pathology while maintaining a high sensitivity and specificity similar to that of laparoscopic chromopertubation Moreover, it can be done for patients who have bronchial asthma or cardiac problems and are temporarily unfit for surgery.^(10,11,12)

Sonohysterosalpingography eliminated the need for iodinated contrast and ionizing radiations with their associated risks. There is no need for radiologic facilities or operation with anaesthesia. It may be performed by a gynaecologist with standard real time equipment an increasingly common commodity in modern infertility practice.

In a comparative evaluation of sonosalpingography hysterosalpingography and laparoscopy for determination of tubal patency SealSbrata Hall et al⁽¹³⁾ SSG for diagnosis of tubal patency has a

ORIGINAL ARTICLE

7.3% sensitivity and 92% specificity and the sensitivity of HSG is slightly less (94.6%) and specifically 84%.

CONCLUSION: Thus, sonohysterosalpingography (SHSG) is an invaluable diagnostic procedure meeting the demands of the need for simple, safe, non-invasive, cost effective short procedure for testing tubal patency that can be performed on an ambulatory basis. If any abnormality is detected on SHSG then HSG or Hysterosalpingography can be done for confirmation.

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ORIGINAL ARTICLE

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