

Saline Contrast Sonohysterography Findings in Nigerian Patients with Infertility

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Abstract: A recent advance in clinical radiology is the use of Sonohysterography for the assessment of the female reproductive system, especially in infertility. However, to the best of our knowledge, there is no published article yet on its findings and acceptability in the Nigerian environment. Thus, we decided to determine the findings of Saline Contrast Sonohysterography (SCSH) in patients with infertility; assess its acceptance by patients among consecutive patients referred to radiology department of Obafemi Awolowo University Teaching Hospital, Ile-Ife, Osun State, Nigeria between 1st of January and December 2003. One hundred patients were studied with their ages ranging between 22-44 years and a mean of 30.94 ± 4.87. Saline contrast Sonohysterography was well accepted by a greater proportion of the patients. The majority of the subjects 60 (60%). Found Hysterosalpingography (HSG) more painful compared with only 15 (15%) reported SCSH as being more painful. The abnormalities detected ranged from leiomyoma in 25 (25%); synechiae (7%); Hydrosalpinges 17%; tubal blockade 2 (2%) to normal findings in 49 (49%) of patients. It is concluded that SCSH, is a cheap and safe mode of investigating infertile female patients and it is well accepted in our environment.

Key words: Saline contrast, sonohysterography, infertility, HSG

INTRODUCTION

Radiological investigative techniques have continued to play major roles in management of obstetric and gynecological diseases. Hysteroscopy with biopsy is the gold standard for evaluation of uterine cavity especially as a reliable and safe method in routine outpatients' setting (Jong *et al.*, 1990). Due to a relative non availability of hysteroscopy equipments in developing countries like Nigeria and its invasive nature, SCSH is becoming an alternative for examination of endometrium and uterine cavity (Smith *et al.*, 1998; Karlsson *et al.*, 1995). This is because SCSH is not invasive and requires no ionizing radiation.

Despite the advent of Sonohysterography since 1993 (Parson and Lense, 1993), no study has been published in this environment to assess its usefulness. The aim of this study, is to assess its diagnostic value and acceptability since it is not only readily available but also cost effective and does not utilize ionizing radiation unlike HSG.

MATERIALS AND METHODS

One hundred consecutive patients seen at the Radiology department of Obafemi Awolowo University Teaching Hospitals Complex from January to December 2003, referred from the hospitals' gynecologic clinics and other medical centers because of infertility were studied. Prior to the study, informed consent was obtained from the subjects before both procedures (HSG and SCSH) were carried out on them. Also the patients were counseled appropriately.

Ethical approval was also obtained from the ethical committee of the Obafemi Awolowo University Teaching Hospitals Complex, Ile-Ife. Pregnant females, those with acute pelvic inflammatory disease, patients with recent dilatation and curettage or bleeding per vaginam and those who failed to complete the two investigative procedures were excluded from the study.

Saline contrast Sonohysterography was done during the early/mid proliferative phase of the menstrual cycle (Debra *et al.*, 2004) following the technique described by

Duelhorm *et al.* (2001), Lev-Toaff *et al.* (1996), Laifer *et al.* (1999) and Debra *et al.* (2004), with minimal modification: a 5-8F Foley's catheter was used for the introduction of contrast and ultrasound scanning done transabdominally with a 3.5 MHZ linear probes. Hysterosalpingography was also done on 10th day of menstrual cycle to avoid radiation of unfertilized ovum and damage to organogenesis in recently implanted embryo (Mole). Our technique of HSG had also been previously described by Adetiloye (1995).

Normal SCSH finding was typified by normal sized uterus with smooth outlines and homogenous myometrial echoes. In addition, saline filled endometrial cavity of uniform thickness, homogenous echo texture and not displaced by any submucous or myometrial abnormalities and no adnexal mass with prompt spill of normal saline into the Pouch of Douglas were considered normal. In cases where a preliminary scan revealed fluid in the Pouch of Douglas, an increase in the volume of the fluid (after injection of saline) confirmed tubal patency.

RESULTS

Study population: One hundred patients with age range of 22-44 years and a mean age of 30.94 +/- 4.87 were studied. The majority of the patients were between 26-30 years of age (Fig. 1).

Pain perception/acceptance: Seventy four percent patients complained of moderate to severe pain during HSG compared with 30 (30%) that complained during SCSH. Sixty percent of the patients described HSG as more painful than SCSH, 18 (18%) responded that the pain/experience was the same; 7 (7%) patients were not sure while 15 (15%) felt SCSH was more the painful (Fig. 2).

Findings at imaging: Forty nine (49%) subjects had normal uterus and fallopian tubes while 51 (51%) showed abnormalities. Myomas and Polyps were responsible for the largest number of the abnormalities 25 (25%). Seven of these were intracavitary lesions classified by SCSH as submucous fibroids 5 (5%) and polyps 2 (2%). Sixteen patients had intramural and 2 subserous fibroids. Their sizes, sites and extent of protrusion into the cavity were clearly shown (Fig. 3). Synechiae, were found in seven patients and these appeared either as a non distensible endometrial cavity with or without marked reflux of contrast (normal saline) as seen in 5 of the patients or as a thick echogenic band in the endometrial cavity, seen in 2 patients (Fig. 4). Hydrosalpinges were seen in

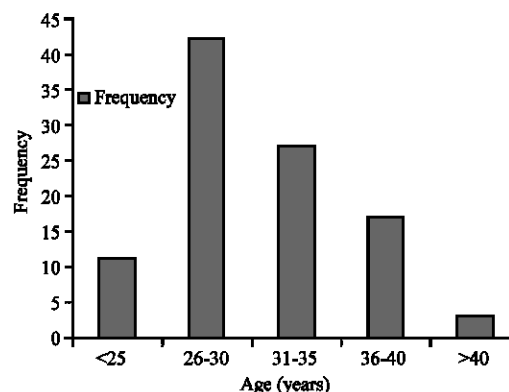


Fig. 1: Age distribution of the patients

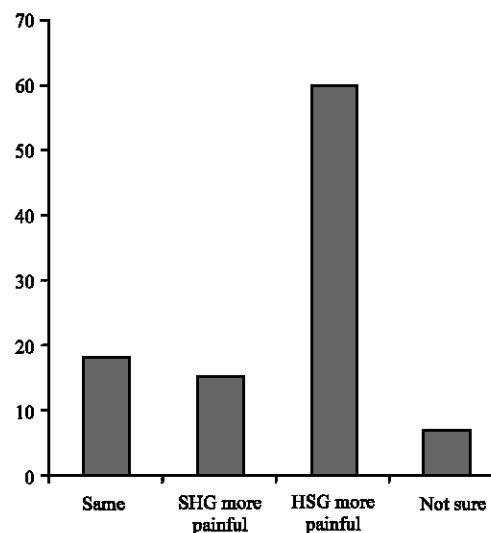


Fig. 2: Bar chart of pain experience in both procedures

17 patients which consisted of 6 (left) and seven (right) hydrosalpinx and 4 bilateral cases. None of these was seen in the preliminary scan but they appeared as progressively increasing dimensions of oval shaped hypoechoic adnexal masses on transverse scan following introduction of normal saline (Fig. 5). The inner walls of the fallopian tubes were well demonstrated and few showed thick fibrotic strands. Only two cases of tubal occlusion were seen on SCSH. However, these were cases of bilaterally blocked fallopian tubes since evidence of tubal patency, (fluid in the pouch of Douglas) could have been caused by patency of one or the two tubes.

Five of these patients had ovarian cysts-two on the left, one on the right and two bilaterally. These were differentiated from hydrosalpinges because they were demonstrated on the preliminary pelvic scan; appeared rounded and echo-free with no progressive increase in size during saline infusion.



Fig. 3: SCSH-longitudinal scan showing intramural fibroid (black star) and calcified fibroid extending into the cavity (black arrow)



Fig. 4: SCSH-transverse scan showing diffusely bulky uterus (intramural fibroid); thick echogenic band in the uterine cavity-synechiae (thin white arrow) and right side ovarian cyst (thick white arrow)



Fig. 5: SCSH-transverse scan showing bilateral hydrosalpinges (black arrow)

DISCUSSION

Most techniques of sonohystero-graphy described by several authors had a lot of similarities (Parson *et al.*,

1993; Debra *et al.*, 2004; Duellhorn *et al.*, 2001; Lev-Toaff *et al.*, 1996; Laifer *et al.*, 1999). They all agreed that the procedure should be carried out during the early/mid proliferative phase of menstrual cycle because the endometrium would be thinnest at this period and focal lesions such as polyps would be easily detected; false positive findings from folds and wrinkles of endometrial lining seen in secretory phase would also be avoided (Debra *et al.*, 2004). Saline contrast Sonohystero-graphy in this study was carried out in the early proliferative phase of the patient's menstrual cycle. While the authors also agreed that Pelvic Inflammatory Disease (P.I.D) is a contraindication, Goldberg *et al.* (1997) actually did Microscopy, Culture and Sensitivity (MCS) of endocervical swabs for all the patients before SCSH.

However, in this study, P.I.D was excluded by taking necessary history and by vaginal examination. Patients with clinical features of P.I.D were then sent for MCS and treated before the procedure. Patients were not routinely subjected to MCS because of the cost implication in this environment.

Though, Goldberg *et al.* (1997) gave non steroidal antiinflammatory drugs thirty-minutes before SCSH in their study, analgesics was not used before, during or after the procedure in this study as was the practice in some of the other similar studies (Laifer *et al.*, 1999; Parson *et al.*, 1996). A variety of catheters can be used to introduce contrast during sonohystero-graphy: Goldberg *et al.* (1997) and Laifer *et al.* (1999) used 5 or 7 French hysterosalpingogram catheters; Parson *et al.* (1993) utilized saules Intrauterine Insemination catheters (IUI) and premature infant feeding tubes (38 cm in length; 1.6 mm in diameter).

Though these catheters were described as fine, straight and allowed painless uterine distension since they permitted leakage of saline from cervix (Parson *et al.*, 1993, 1996; Laifer *et al.*, 1999; Goldberg *et al.*, 1997), they are not available in our environment and sizes 5-8 Foley's catheters were used. This may explain why 54 patients (54%) had mild pain after the SCSH in our study and most studies described the procedure as painless (Parson and Lense, 1993; Goldberg *et al.*, 1997; Parson *et al.*, 1996). Although, most patients still described SCSH less painful than HSG (Fig 2).

All the studies reviewed used normal saline as contrast agent and this was found in the present study to be well tolerated. In addition normal saline is readily available and cheap in Nigeria. The patients were scanned before, during and after introduction of normal saline (longitudinal and Transverse); however unlike other studies, Transabdominal scan was used due to the non availability of a transvaginal probe. Pitfalls such as blood

clots and air were avoided by appropriate booking of patients, avoidance of trauma to the cervix and flushing the catheter with saline before introduction. While blood clots were found to be echogenic, unattached/mobile and became displaced with further saline introduction, in advertently introduced air bubbles gave bright reflection that dispersed into tiny bubbles during saline introduction.

Majority of the patients were aged between 26-30 years which coincides with the active reproductive age group. Forty five patients (45%) presented with primary infertility while 55 (55%) presented with secondary infertility. Saline contrast Sonohysterography was able to depict most of the common uterine and tubal pathologies clearly and even showed ovarian lesions which are often not obvious on HSG. The submucous lesions were easily classified as polyps and fibroid based on their echogenicity and echotexture which would not be possible on HSG. Hydrosalpinges, uterine synechiae and bilaterally tubal blockage were also demonstrated. No congenital anomaly was however seen though not surprising because of their rarity. Severi reported incidence of 0.16% in fertile and a mean prevalence of 3.5% in infertile women. However, Goldberg *et al.* (1997) reported 2 cases of septate/bicornuate uterus in their series though SCSH could not differentiate between these two anomalies. Five patients had incidental findings of ovarian cysts which showed SCSH had an edge over HSG; Goldberg *et al.* (1997) and Debrah *et al.* (2004) also reported that Sonohysterography can also reveal adnexal masses.

CONCLUSION

Sonohysterography is a well accepted and safe mode of investigating female patients with infertility. Its advantages include ability to detect submucous, intramural and subserous lesions; tubal and adnexal pathologies. However, unilaterally blocked tubes were not detected on SCSH; therefore SCSH should be used as a frontline method of investigation in this environment while HSG can be reserved for patients that need further tubal definition.

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