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Research Article

HYSTEROSALPINGOGRAPHY (HSG) - AN INVALUABLE INVESTIGATION FOR INFERTILITY MANAGEMENT

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ABSTRACT

Tubal Blockage accounts for about 25-35% of female infertility (*Vandhyatva*), yet it is often the last factor to be investigated during the infertility management. Out of the various methods available to evaluate tubal patency, Hysterosalpingography (HSG) is a highly informative, easy, economical and reliable investigative procedure which can be carried out in an *Ayurvedic* set up. The present study is an effort to determine the prevalence of Tubal Block in Jamnagar district, Gujarat and to study the problems encountered during the procedure or any complications if caused and to assess the efficacy of *Ayurvedic* measures to combat those problems.

INTRODUCTION

Infertility is the single most sensitive and cumbersome problem which haunts every couple. The situation gets even more gloomy as it is a problem often involving multiple factors .The diagnosis and treatment of all the responsible factors puts the family to physical and mental stress in addition to the financial expenses it involves.

The tubal causes account for about 25-35% cases of infertility,[1] but despite this high prevalence this factor was until recently the last to be investigated. The tests which can be employed to diagnose the patency of Fallopian Tubes are Hysterosalpingography (HSG), Chromopertubation (Laparoscopy), Hysteroscopy and Sonosalpingography. HSG was preferred to be the investigative procedure over others for this study as it has minimum false negative and false positive results. Besides being economical, it can be easily performed by an *Ayurvedic* gynaecologist in an *Ayurvedic* set up. HSG not only confirms the patency of fallopian tubes but also reflects the condition of uterus and adjacent structures.

During the study, HSG was found to be highly informative and useful procedure to evaluate tubal blockage along with other causes of infertility. Similar study conducted in the past had substantial evidence[2], but the sample size was only of 51 patients. Therefore, in the present study it was decided to validate the data on the basis of findings obtained from larger sample. The data related to the patients undergoing HSG has been analyzed and the information obtained from the 175 HSGs carried out is being presented here.

Aims and objectives

1. To compare the regional prevalence of Tubal infertility with the global incidence.
2. To determine the problems encountered during the procedure.T
3. To study the efficacy of *Ayurvedic* measures to combat these problems.

METHODOLOGY

The HSGs have been carried out by the Department of *Stree Roga & Prasooti Tantra* (SRPT) in collaboration with the Radiology Department 175 patients having the complaint of failure to conceive were randomly selected from the OPD of SRPT Department without considering primary or secondary status of their infertility.

Preliminaries: HSG was carried out in all the patients within 7 days of cessation of their normal menstrual period. All the patients expected to undergo HSG were admitted 1 day prior to

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the day of HSG. Routine blood, urine, HIV, VDRL & HBsAg were done in all patients in order to rule out any active infection. All the instruments were autoclaved before the procedure.

Procedure: [3,4] Patient was asked to empty the bladder prior to procedure. Injection Atropine was given intravenously to prevent vasovagal shock and to relax the smooth muscles so that the chances of false positive reports are minimized.

The patient was then kept in dorsal position at the edge of the X-ray table. Aseptic and antiseptic conditions were maintained throughout the procedure. Autoclaved gown, cap mask and gloves were worn by the doctor and the assistant.

To begin with, the vagina and vulva of the patient was cleaned using antiseptic solution. The patient was draped with an autoclaved cut sheet in order to isolate the part being worked on so that any kind of contamination from surrounding area was prevented. Cervix was exposed with the help of Sim's speculum and anterior vaginal wall retractor. The anterior lip of the cervix was caught with Allis' forceps. Sounding of the uterus was done. Leech Wilklinson's Cannula[5] was introduced into the cervix and was tightened at the external os. The radio-opaque dye (Urograffin 60%) was taken in a 10 ml syringe and attached to the cannula. 5-10 ml of dye was slowly injected into the uterus and the patient was shifted upwards with the cannula in position so that the pelvis came to lie over the X–ray source. X –ray was taken and the films dried and viewed. Cannula was kept in place till the wet plates were examined and found satisfactory. In some cases when the spill was not clearly evident another film was taken after 15 min to look for delayed spillage.

Possible complications of HSG are

- Immediate complications-Pain, bleeding, hypersensitivity to dye, regurgitation and vasovagal shock.
- Late complications-PID, Endometriosis

Observations

Table 1 Infertility wise distribution

Infertility	No. of patients	Percentage
Primary	123	70.29%
Secondary	52	29.71%

Table 2 Distribution of patients with tubal blockage

Tubal patency	No. of patients	Percentage
Positive(no block)	106	60.57%
Negative(block)	69	39.43%

Table 3 Findings of tubal blockage from study population

Findings	No. of patients	Percentage
Unilateral Block	37	21.14%
Bilateral Block	32	18.29%

Table 4 Unilateral tubal blocks – distribution according to the site of block

Unilateral tubal block	Site	No. of patients	Percentage
Right tubal block		21	12%
	Cornual	13	7.43%
	Mid tubal	2	1.14%
	Fimbrial	6	3.43%
Left tubal block		16	9.14%
	Cornual	09	5.14%
	Mid tubal	01	0.57%
	Fimbrial	06	3.43%

Table 5 Bilateral tubal blocks- distribution according to symmetrical involvement

Bilateral block	No. of patients	Percentage
Symmetrical	26	14.86%
Asymmetrical	06	3.43%

Table 6 Asymmetrical tubal blockage

Asymmetrical	No. of patients	Percentage
One cornual, one middle	03	1.71%
One cornual, one fimbrial	03	1.71%

Table 7 Other pathologies

Pathological finding	No. of patients	Percentage
Uterine hypoplasia	04	2.29%
Bicornuate Uterus	01	0.57%
Unicornuate Uterus	04	2.29%
Irregular cavity	01	0.57%
Uterine Fibroid/Polyp	02	1.14%
Tubo-ovarian mass	06	3.43%
Dilated tube	05	2.86%
Beaded appearance of tube	07	4.00%
Hydrosalpinx	03	1.71%
Adhesions	03	1.71%
Elongated cervical canal	03	1.71%
Ovarian pathology	03	1.71%

Table 8 Problems observed in procedure of HSG during study

Problems faced during the procedure	No of cases
Difficulty pre procedure	
Anxiety	42 (24%)
Hypersensitivity to Atropine	01 (0.057)
Difficulty in visualizing cervix due to	
Fatty labia majora covering the introitus	10 (5.71%)
Lax vaginal wall	15(8.57%)
Pain due to vaginismus	15(8.57%)
Difficulty to hold an appropriate position by obese patients	11(6.29%)
Difficulty in catching anterior lip of cervix	
Very short cervix	05(2.86%)
Anterior lip not well developed	04(2.29%)
Problems while introducing cannula	
Pinhole external os	11(6.29%)
Stenosed cervical canal	05(2.86%)
Stenosed internal os	10(5.71%)
Acute anteverted / Retroverted uterus	20(11.43%)
Moderate to severe pain	17(9.71%)
Difficulty while introducing the dye	
Problems in pushing dye against resistance in case of B/L tubal blockage	17(9.71%)
Pain when dye reached into the peritoneal cavity	19(10.86%)
Leaking out of the dye	11(6.29%)
Difficulty to determine the volume of dye to be introduced	07(4%)

Table 9 Complications associated with HSG

Complications	No. of cases
Complications before procedure	
Hypersensitivity to Atropine	01(0.057)
Complications after procedure	
Pain	11(6.29%)
Bleeding P/V	07 (4%)
Genital tract infection	01(0.057%)
UTI	00

Out of 175 patients registered, maximum patients i.e. 70.29% had primary infertility (Table -1), 39.43% patients were found to have tubal blockage in HSG (Table -2), 21.14% had unilateral block, while 18.29% had bilateral tubal blockage (Table -3). Right tubal block was found in 12% while left tubal block was found in 9.14%. Cornual block was found in 12.57% patients (Table -4). Symmetrical blockage was found in 14.86% patients while asymmetrical blockage was found in 3.43% patients (Table -5). Other abnormalities like bicornuate uterus, hydrosalpinx, adhesions, elongated cervical canal, ovarian pathology and lead pipe appearance were found in 1.71% patients each (Table -7). Beaded appearance of tube and dilated tubes were seen in 4% and 2.86% patients. The main difficulties encountered during the HSG procedure were anxiety (26 patients), moderate to severe pain, stenosed cervical canal and the leakage of dye (Table -8). The minor complications in the form of pain and per vaginal bleeding were also found in few cases. (Table - 9)

Ayurvedic measures which were taken to prevent and overcome the problems arising during the procedure.

General measures

- *Dashmoola Kwatha*[6] ½ cup BD was given to all patients from 1st day of the menstrual cycle till the day of HSG.
- *Mansyadi Kwatha*[7] ½ cup BD was given for 3 days before performing HSG.
- *Panchavalkala Kwatha*[8] *Yoni Prakshalana* just before the procedure
- *Snehana* of *Bala Taila*[9] on lower abdomen and back just before the procedure.
- *Nadi Sweda* on lower part of the body soon after *Snehana*.

Specific measures: Intrauterine *Uttarbasti* of 5 ml *Sahachar Taila* was done for a period required, in patients who came with reports of failed HSG because of cervical stenosis or stenosed os. Since the normal method of administering *Uttarbasti* was not feasible in these cases, some modification was required. In all such patients Leech Wilklinson's cannula was introduced up to maximum possible extent and oil was pushed. Cannula was taken out just after pushing the oil. It was found helpful in opening os and reducing the stenosis.

Correction of pinhole os was done with the help of gradual dilatation and *Uttarbasti* over a period of few days after cessation of menstruation and the HSG was performed in the next cycle in such patients.

Post procedure Ayurvedic measures

- *Chandraprabha Vati*[10] 2 tablets BD for 5 days was given
- *Dashmoola Kwatha* ½ cup BD was continued for 7 days
- *Shamkha Vati*[11] 2 tablets SOS was given as anti spasmodic in case need arose.
- *Raktastambhaka Yoga*, (containing *Nagakesara, Khadira, Sphatika* and *Gairika* in equal parts) along with *Ashoka* & *Lodhra Churna* was given with juice of *Doorva* to the patients who complained of bleeding. Dose and duration of drug administered was decided as per the requirement.

DISCUSSION

Tubal blockage is responsible for 25-35% cases of infertility. Out of 175 infertile patients investigated for tubal factor, tubal blockage was found in 39.43% i.e. 69 patients. The study sample needs to be larger in order to assess the actual prevalence of this disease. Still the data is very important, especially for *Ayurvedic* gynaecologists, as it shows the need of serious researches on tubal blockage in *Ayurvedic* institutes. (Table-2)

The 18.29% patients were suffering from bilateral blockage, which reduces their chance of getting pregnancy to 0%. As it is quite a significant percentage, it becomes our responsibility to diagnose them and to treat them up to our maximum possible extent. The 21.14% patients were suffering from unilateral tubal blockage, which though, not makes conception impossible for them, but definitely reduces its probability. Among unilateral block, 12% patients had block in right tube, while 9.14% patients had left tubal block. Cornual block was the most common, as it was seen 7.43% in right and 5.14% in left tube. This data suggests the established fact that most of the inflammatory conditions of tubes lead to proximal tubal blockage[12] (Table -3), (Table-4), (Table-5), (Table-6).

HSG also proved very beneficial to diagnose the other uterine pathologies which were undiagnosed until then. It helped to get the accurate cause of infertility in those cases and led to the path of corrective management. 4.00% cases were suspected of genital tuberculosis because of beaded appearance in tubes (Refer Table -7). These were confirmed by other specific investigations and anti-tubercular drugs were started in total 7 patients (4.00%). The X-Ray chest was taken at the same time, and the patients were investigated further, after finding tubercular changes in chest X-Ray. As all the cases were undiagnosed tubercular patients until HSG was performed, it again proves the significance of this investigation to get the exact cause of infertility.

A very important and noticeable observation which emerged during scanning of infertile patients for tubal blockage was significant prevalence of tuberculosis, which remained undiagnosed till it was suspected in HSG films. It was given due importance and the reasons behind it were tried to evaluate. History of pulmonary tuberculosis was found in only 2.29% patients, while in another 4.57% it was not positive. Surprisingly, none of the patients gave history of anorexia and weight loss. History of long term fever was found in 2.29% patients only. General debility was found in only 1.71% patients. Hence, all the important features of tuberculosis were not observed in the patients who were diagnosed as suffering from genital tuberculosis, and it could be the reason why it remained undiagnosed for so long. Amenorrhoea, which is considered an important menstrual symptom of genital

tuberculosis, was not present in any of these patients. The 2.86% patients gave the positive history of oligohypomenorrhoea, which is, though a symptom, but not specific to tuberculosis.

HSG though one of the most significant investigation of infertility is not that much popular nowadays. One of the most important reasons is that several problems and complications come during and after the procedure and sometimes it makes the procedure a failure. So, an effort was made to document those problems as well as to correct them within maximum possible limit. For this purpose, some *Ayurvedic* drugs and procedures were used which gave good results.

Dashmoola Kwatha was given with aim of clearing of menstrual flow and pacifying the exaggerated *Vata* during *Rajahkala* because of its *Vatashamaka* and *Rajahpravartana* property. Normalized function of *Vata* may reduce the possibility of causing endometriosis as a complication of HSG by preventing the regurgitation of blood through the tubes. No patient suffered from any symptom suggestive of endometriosis during the follow up. Anxiety reduces the compliance of patient and sometimes the confidence of performer too. Because of it, there occurs the voluntary contraction of muscles, i.e. vaginismus, which leads to so many problems and sometimes makes the procedure a failure. *Mamsyadi Kwatha* for 3 days before HSG was given to those patients who showed features of anxiety or vaginismus during the P/S or P/V examination, carried out in all the patients before selecting the patients for HSG. HSG was successfully carried out in all those patients. *Panchavalkala Kwatha Prakshalana* was done as an aseptic measure in all the patients just before the HSG. And it worked nicely, as no patient suffered from UTI, lower or upper genital tract infection during the follow up period.

Snehana and *Swedana* were performed to achieve good *Vatanulomana* and *Vedanashamana* to relax the uterine muscles and to prevent the pain as much as possible. It is important to note that pain itself becomes a cause of failed procedure by voluntary contraction of muscles. This is one of the factors why HSG was successfully performed in all the patients without using any modern analgesic drug. Two cases with reports of failed HSG in established centres due to stenosed cervix, were selected for intra uterine *Uttarbasti* before HSG. The procedure was successfully performed in all those cases. Management implemented to the patients of pinhole os made HSG possible in those cases, which shows the importance of *Uttarbasti* with the dilatation measures.

Chandraprabha Vati was given to all the patients after the procedure, as it is well known for its anti-inflammatory property, especially regarding the urogenital system. It may be one of the causes why any post procedural urogenital infection was not reported in any case. *Shamkha Vati* was used as an antispasmodic in the cases who reported pain after procedure and pain was subsided in all the cases. Some patients reported spotting bleeding after procedure. Drugs which were used to check the bleeding gave good results and no need of Allopathic treatment was felt.

Only in one case (0.057%), the injection of Atropine created hypersensitivity like reaction. This shows that such type of reaction is very rare and should not be considered as a common complication. However, the performer should always be prepared to diagnose and refer the patient to higher centres in case such thing happens. One patient (0.057%) was found to have severe pain in abdomen, a month after HSG for which hospitalization was required. Later on, she was diagnosed as having intestinal tuberculosis. This could be coincidental and should not be totally attributed to HSG but the possibility of it cannot be entirely denied. It suggests that no therapy or procedure is free from side effects and chances of complications always persist.

CONCLUSION

Tubal blockage is still a very important causative factor of *Vandhyatva* or infertility. And it is proved by this study that the infertile women visiting *Ayurvedic* gynaecological clinics suffer from this problem in a great extent. Hysterosalpingography can be successfully performed by *Ayurvedic* gynaecologists to investigate tubal blockage and many other undiagnosed causes of infertility, if proper care is taken before, during and after procedure. It is important to know the problems which can come during and after the procedure and be prepared to manage them through *Ayurveda*. Some of the minor *Ayurvedic* measures definitely play an important role to negotiate these problems and also to prevent complications. Problems during the procedure and complications can be managed successfully by using *Ayurvedic* measures.

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