Certain aspects of Hystero-Salpingography

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SUMMARY

A Review of 129 cases of Hysterosalpingography (HSG) performed during the 5 year period (1969 – 1973) in the Hospital Bersalin, Kuala Lumpur, disclosed that the main indication was for infertility investigation. Fourteen patients conceived within one year after HSG. Two cases of complications were noted.

The application of HSG, its diagnostic and possible therapeutic value in infertility, its pitfalls in diagnosis and its potential complications are discussed and the available literature reviewed.

INTRODUCTION

Hysterosalpingography (HSG) was initially introduced as a method for evaluating the tubal factor in infertility. With the passage of time its indications have increased, and to-day HSG has become an integral part of gynaecological diagnosis.

As early as 1909 Nemenow suggested the Introduction of Lugol's iodine into the uterine cavity to obtain an x'ray picture of this organ. In 1914 Rubin and Cary introduced an approach more closely related to the current method of HSG – using Collargol as contrast medium to demonstrate tubal pregnancy. Kennedy, (1923) suggested the use of HSG for locating the site of tubal obstruction prior to salpingotomy. Since then many papers on the various diagnostic possibility of HSG and the information obtainable by this method of examination have been published. (Ko Chi San. 1948), (Rozin, 1954) (Rozin 1956), (Poidevin 1962).

MATERIAL AND METHOD

All recorded cases of HSG performed in the Obstetric and Gynaecology Department, General Hospital. Kuala Lumpur, during the five-year period (1969–1973) were included in this study. The infertility cases in this series were required to satisfy the following conditions:–

1. Both husband and wife are healthy.
2. Seminal assay of the husband is within normal limits.
3. No apparent organic cause of infertility present.

The HSG was performed in the intermenses phase of the cycle – between the 5th day after cessation of bleeding and the week before the expected menses. Before the HSG was performed a detail menstrual history was taken, a complete pelvic examination done and pelvic infection excluded.

The procedure was performed under strict aseptic condition. The contrast medium used was Diagnol viscous (40% solution of sodium actrozoate with dextran). All patients were given premedication with pethidine 50mg. intramuscularly half an hour prior to the procedure.

The patient was put in lithotomy position and a pelvic examination done. The vagina was retracted with a Sim's speculum and the anterior lip of the cervix held with a pair of volsellum forceps. A cannula through which the contrast medium was to be injected was screwed to fit snugly into the cervical canal. The syringe containing 10 ml. of the contrast medium was attached to the cannula. The Sim's

*A Study project carried out by Dr. Lim Thin Peng during his tenure as House Officer in the Department from 7.5.74 to 6.11.74.

speculum was then removed leaving the cannula and syringe in situ. The patient's legs were lowered to allow a supine position. The contrast medium was then injected. The amount and the rate at which the medium was injected into the uterine cavity was guided by visualising the uterine and tubal filling under fluoroscopy. Selective films were taken when required. No delayed film was taken and the patient allowed home half an hour later if there were no immediate complication.

RESULTS

Applications of HSG and their findings:

A total of 129 cases of HSG performed during the period 1969 to 1973 were included in this analysis. The indications are shown in table I.

Table I

Indications of HSG

Indications	No of cases
Primary infertility	76 (58.8%)
Secondary infertility	41 (32.0%)
Recurrent abortion	3 (2.3%)
IUCD translocation	3 (2.3%)
Others	6 (4.6%)
Total	129 (100%)

The commonest indication for HSG in our series was for infertility investigation (90.8%). Of these primary infertility constituted the larger portion with 76 cases (58.8%) and 41 cases (32%) were for secondary infertility. Three cases of recurrent abortion, three cases of suspected intrauterine contraceptive device (IUCD) translocation and 6 cases of other gynaecological problems were also investigated.

Of the 6 gynaecological problems three were for investigation of tubal patency after gynaecological operation:– one post-abdominal tubal ligation, one post-salpingectomy for ectopic pregnancy and another post-tuboplasty. The other 3 cases consisted of:– one suspected perforated uterus after dilatation and curettage (D. & C.), one suspected congenital malformation of the uterus and one suspected dehiscence of old Caesarean scar following an assisted breech delivery. The HSG findings are shown in table II.

Table II

Hystero-salpingography findings

Findings \ Indications	1° infert.	2° infert.	Recur. abort.	others
Patent	40	17	3	7
Unilateral occlusion	10	4		1
Bilateral occlusion	26	20		1
Bicornuate uterus	1	–		1
Intrauterine mass	5	–		–
IUCD in uterine	–	–		3
Hydrosalpinx	1	3		–
Cervical incompetence	–	–	1	–

Forty of the 76 cases done for investigation of primary infertility showed normal tubal patency, 10 with unilateral tubal occlusion and 26 with bilateral tubal occlusion. In addition, 5 cases had films suggestive of uterine fibroid (intrauterine mass) and one showed hydrosalpinx. Seventeen of the 41 secondary infertility cases had normal tubal patency, 4 with unilateral occlusion and 20 with bilateral occlusion. Cervical incompetence was reported in one of the 3 recurrent abortion cases whereas the other 2 cases had normal HSG. The HSG of all 3 cases suspected of translocation showed that the IUCD were within the uterine cavity.

Duration of infertility prior to HSG (table III).

Fifty percent of the primary infertility cases were investigated after 3 – 5 years of involuntary infertility, 26% after more than 5 years and 24% after only 1 – 2 years. Of the secondary infertility cases 30% were investigated after more than 5 years of involuntary infertility, 32% after 3 – 5 years and 29% after only 1 – 2 years.

Table III

Duration of involuntary infertility

Years	Primary infertility		Secondary infertility	
	Total No. of cases	Cases eventually preg.	Total No. of cases	Cases eventually preg.
1 – 2	18 (24%)	5	12 (29%)	2
3 – 5	38 (50%)	4	13 (32%)	–
5 – 7	20 (26%)	1	16 (39%)	2
Total	76 (100%)	10	41 (100%)	4

Correlation of HSG and Tubal insufflation findings:

Not all the cases of infertility had both tubal insufflation (TI) and HSG performed. There was a period of a few months when the tubal insufflator was under repair. The correlation of HSG and TI findings are shown in table IV. Only 73 of these cases of infertility had TI done prior to HSG.

Table IV

Hystero-salpingography / Tubal Insufflation	Both tubes patent	Unilat. tubal block-age	Bilat. tubal block age or spasm of tubes	Total
Both tubes patent	14	3	8	25
Unilat. tubal blockage	1	1	4	6
Bilat. tubal blockage/ spasm of tubes	16	7	19	42
Total	31	11	31	63

Out of these only 34 cases (47%) had diagnostic findings for tubal patency indentical in both procedures.

Pregnancy after HSG

The follow-up of infertility cases after HSG in this series was poor. Quite a number of patients defaulted after one or two subsequent visits and many never returned after they were informed of the HSG findings. As such how many of these patients eventually become pregnant was impossible to assess. The number of known pregnancies after HSG is shown in table V.

Table V

Pregnancy after HSG

Interval (months)	Pri. infertility	Sec. infertility	Total
0 - 3	6 (2)	4 (2)	10 (4)
4 - 9	2 (2)	—	2 (2)
10 - 12	2 (2)	—	2 (2)
14 - 24	10 (6)	4 (2)	14 (8)

(Cases with tubal insufflation done prior to HSG shown in parenthesis).

Among the group who were followed up, 14 eventually conceived. 10 within 3 months: 2 within 4 – 9 months and 2 within 10 – 12 within after the HSG. Eight of them had tubal insufflation prior to HSG. Of these 14 cases 7 had voluntary infertility for a period of 1 – 2 years, 4 for 3 – 5 years and 3 for more than 5 years (Table III). It is of interest to note that 3 of the 14 cases who became pregnant were reported to have bilateral tubal occlusion. The outcome of these fourteen pregnancies were difficult to trace in retrospect as these were referred to the Ante-natal Clinics and became part of a very large patient population involving more than 24,000 outpatient visits per annum.

Complications

Two cases of mild complications due to HSG were recorded. One patient developed severe abdominal pain soon after HSG. The pain lasted for 2 days but it responded to symptomatic treatment. Another patient had slight bleeding from the cervix traumatised during the insertion of the cannula. A woman who conceived after her tubes were previously ligated had HSG done inadvertently for investigation of tubal patency and she aborted 2 weeks after the procedure.

DISCUSSION

Application of HSG

The most important application of HSG is in the diagnosis of pathological conditions of the fallopian tubes in cases of infertility. With the aid of fluocroscopy the whole process of tubal filling, tubal passage and tubal evacuation may be clearly visualised and the peristaltic movement of the tubes observed. Tubal occlusion can be precisely diagnosed and localised by HSG and salpingography findings may be decisive in determining the management in cases of partial or complete tubal occlusion. Peritubal adhesion and the presence of tubal distortion and displacement can be revealed by salpingography. Hysterosalpingography has also been attributed to have therapeutic effects in cases of partial tubal occlusion due to flimsy adhesions.

Hysterosalpingography is a valuable method in detecting some of the causes of repeated abortions. Rozin (1965) reported a series of 200 consecutive and unselected cases of HSG performed in women who had two or more spontaneous abortions. The HSG revealed uterine fibroma in 27 cases, congenital

malformation in 25 cases, intrauterine filling defects in 26 cases and other uterine anomalies in 10 cases, thus, revealing a possible cause of repeated abortion in almost half of all the cases. The other possible causes of repeated abortion detectable with HSG are fixed retroverted uterus and cervical incompetence.

When translocation of intra-uterine contraceptive device is suspected, HSG is the method of choice for detecting the IUCD presence in the uterine cavity. When such indication is present it is better to use a small volume of contrast medium (1–1.5 ml.) since large volume may obscure the IUCD shadow.

Malformation of the uterus may present as a case of infertility, menstrual disorder, repeated abortion, premature labour or obstetric complication. Hysterosalpingography aids in the diagnosis in such conditions and its findings may provide an additional basis for classification of congenital malformation of the uterus.

Hysterosalpingography is one of the most valuable and accurate methods for detecting the submucous myomata. (Rozin, 1956). It gives information on the localisation and size of the tumour and the distortion of the uterine cavity. It may serve as a guide in the choice of hysterectomy or myomectomy especially in patients of borderline age group. In cases of menstrual disturbance which repeated curettage has failed to reveal any pathology, HSG may be helpful in revealing a missed endometrial polyp. The percentage of accurate preoperative clinical diagnosis of adenomyosis is between 2.6 – 4.3% (Israel, 1956) and Hysterosalpingography may help in increasing the accuracy.

External and internal genital fistula are difficult to diagnose clinically and are usually diagnosed accidentally while performing HSG.

The diagnosis of genital tuberculosis is difficult because there are no specific clinical symptomatology apart from infertility. In old chronic cases, however, HSG may give a characteristic picture – a dwarfed and shrivelled uterus with varying degree of deformity and irregularity in its contour, (Madsen 1949, Ko Chi San 1948, Jedberg 1950), uterolymphatic intravasation (Drukmass and Rozin, 1951) and occluded tubes and pelvic lymphnode calcification. (Rubin & Shapira, 1931).

Tubo-ovarian mass may show passage of contrast medium from the dilated tube into a second large cavity.

Deformity associated with uterine scar following Caesarean section can be demonstrated by HSG. This is of value in detecting the related weakness of the uterine scare. Poidevin (1961) reported 2 cases of rupture of uterus where previous HSG have demonstrated large defect at the site of Caesarean scar. Doubtful wound healing is said to be represented by a wedge depression more than 5mm. in depth.

HSG compared with Tubal Insufflation

Tubal insufflation and HSG are both used extensively in the investigation of tubal pathology. What advantages each has over the other both diagnostically and therapeutically has frequently been debated. Tubal insufflation is advantageous in tubal patency investigation – it can be used repeatedly as a diagnostic procedure with possible concomitant therapeutic effect without undue complication: there is no risk of converting partial occlusion to become complete occlusion – a possibility with oily contrast media which can cause granulomatous change in the tubes in HSG.

Hysterosalpingography is more useful in locating the exact site of tubal obstruction as well as diagnosing intrauterine lesion and other gynaecological problems (Rubin, 1947). It is helpful to localise the site of tubal obstruction if tuboplasty is considered.

Error in Diagnosis

The possibility of erroneous diagnosis of tubal patency in both tubal insufflation and HSG is a major problem is cases of infertility. Despite repeated demonstrations of tubal occlusion, pregnancy is not uncommon even without further medical or surgical therapy. Three of our patients who had HSG findings of bilateral tubal occlusion eventually became pregnant. Behrman & Poppy (1957) reported pregnancy in 13 out of 74 infertility cases with dilateral tubal occlusion diagnosed on HSG. Ostry (1951) followed up 149 cases diagnosed as bilateral tubal occlusion by HSG – 27 women had one or more pregnancies, 74 women revealed patent tubes on repeated HSG and insufflation and 3 women have patent tubes diagnosed by retrograde insufflation at laparotomy.

Therapeutic benefits

The therapeutic benefits of both procedures (tubal insufflation and HSG) have been reported but there are some who doubt that these procedures actually increase the chances of conception. The

probably mechanisms involved are either the insertion of the cannula breaking down the mucous plug in the cervical canal or the passage of gas or contrast medium causing the breakdown of weak adhesions which caused the closure of the tubes. These factors enchance sperm migration and ovum transport in the fallopian tubes. In our series of 117, 14 cases (12%) eventually conceived within a period of one year. Eight of these cases in addition to HSG had prior tubal insufflation done. William (1969) in his series of 419 cases of HSG done reported that 179 cases (45%) became pregnant after the procedure. Rubin (1947) reported 7 cases of pregnancies after HSG in his series of 53 in whom only HSG was performed and the tubes found not occluded. In another series of 438 cases whose fallopian tubes showed improvement in patency after 2nd and 3rd insufflation 66 cases (15.07%) became pregnant. These figures compare favourably with the incidence of pregnancy after plastic operation for sterility. Greenhill's analysis of 818 cases of plastic operation showed that only 54 cases (16.6%) became pregnant after operation.

Complications

The side effects of HSG have been widely reported. Our series using water soluble contrast medium, Diaginol viscous, had only 2 cases (1.5%) of complications – one with severe pain in the pelvic peritoneal cavity for 2 days and another bleeding from the cervic traumatised by the insertion of the cannula. This incidence compares favourably with other reported series. Smitham (1959) using the same contrast medium in 85 consecutive unselected HSG had 2 patients with severe pain after HSG and 40% complaining of transient and slight pain when the contrast medium entered the tubes or mild to moderate peritoneal pain lasting for less than one hour. None of his patients however had any pethidine or other premedication. In a large series of 2,500 cases Marshak reported pain in 80% of the cases. The other complications he reported were chemical peritonitis with adhesion, granulomatous inflammatory changes, embolism with lipiodol, intravasation with water soluble dye and exacerbation of chronic infection. Steinberg and Bergnan reported foreign body granulomatous formation after use of oily dye in their cases. Woltz and associates (1958) in their paper on HSG complications obtained the following figures:– pain in 2.8%, shock-like syndrome (Nausea, vomiting) 1.8%, infection 1%, traumatic bleeding 0.6% and intravasatation 1.2%.

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