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Radiodiagnosis

THE STUDY OF HYSTEROSALPINGOGRAPHIC FINDINGS IN INFERTILE WOMEN

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ABSTRACT The World Health Organization (WHO) estimates that 60 to 80 million couples worldwide currently suffer from infertility. Infertility varies across regions of the world and is estimated to affect 8 to 12 per cent of couples worldwide. We have conducted a prospective study to evaluate the causes of infertility using hysterosalpingography in 50 female patients. Normal shape of uterus and normal intrauterine surface allows the normal process of implantation to occur. HSG is useful in evaluating all these areas. The present study reveals that HSG could be performed as a first line of investigation in female infertility as it has several advantages as a diagnostic test performed early in the investigation of infertility. It provides immediate and accurate information regarding congenital anomalies of uterus and in demonstrating tubal pathology particularly the side and site of block which is the hall mark for formulation of future surgical procedure.

KEYWORDS : hysterosalpingography, infertility, tubal factor, uterine factor

INTRODUCTION

Infertility is a worldwide problem, affecting the total wellbeing of the individuals or couples involved. It is not just a medical problem but also a social one; it has become a public health issue[1]. Hysterosalpingography is a radiological procedure where radiographs are taken of a female reproductive tract after injection of a suitable contrast media via cannula inserted in the cervical canal. The resulting radiographs obtained after the injection of contrast media depict the uterine cavity, fallopian tubes and possible free spillage of contrast media into the peritoneal cavity if the tubes are patent .It is an easy, safe and useful procedure with favourable outcome[2]. HSG provides us permanent record and shows the exact site of tubal blockage[3]. It does not require hospitalization or anaesthesia[4].

Causes of female infertility:

1. **Tubal factors:**
   Obstruction:Partial and complete.
   Intra and peritubal adhesions.

2. **Ovulatory dysfunction:**
   Anovulation
   PCOD
   Luteal phase defects

3. **Cervical factors:**
   Diminished mucous production
   Sperm antibodies

4. **Pelvic factors:**
   Endometriosis
   PID
   Periadnexal adhesions
   Tuberculosis

5. **Uterine factors:**
   Anomalies
   Endometritis
   Myomas
   Synechiae
   Adenomyosis

6. **Others:**
   Serum antibodies in females
   Chronic vaginitis

MATERIALS AND METHODS:-

This prospective study was conducted in Dr. PINNAMANENI SIDDARTHA INSTITUTE OF MEDICAL SCIENCES AND RESEARCH FOUNDATION, CHINNAOUTPALLI, on 50 infertile female patients with history of primary or secondary infertility during the period of two years from NOVEMBER 2015 TO OCTOBER 2017 for infertility evaluation.

Radiographic instrumentation:
In our study SIEMENS X-ray machine is used.

Contrast medium: Urograffin 76%, 10-15 ml was used.

Cassettes with film of 17"X14"size were kept ready and Right /Left marker was placed on the lateral border of the film holder.

Patient preparation: HSG can be performed as an outpatient procedure. No particular preparation is required. Apprehensive patient may need sedation like Diazepam 10mg intravenously.

Timing of HSG: Hysterosalpingography is performed during follicular or proliferative phase of the cycle, after menstruation has ceased and before ovulation has occurred. Thus window between cycle days 7 and 14 is chosen to avoid potential hazards.

METHOD:
HSG was performed by Leech wilkinson cannula method.

Exposure factors for average built patient i) 73-77KV with Bucky ii) 32-40 milliamps.

Exposures were taken as follows:

1. Immediately after injection of 3-4 ml of contrast medium to demonstrate uterine cavity.
2. After injection of another 7-8 ml of contrast to demonstrate the fallopian tubes and to demonstrate tubal spillage into the peritoneal cavity.

But sometimes four spot films are taken[5]:

1. early filling of uterus
2. uterus fully distended
3. to evaluate fallopian tubes
4. to image intraperitoneal spillage

RESULTS

TABLE 1: INCIDENCE OF NUMBER OF PATIENTS ACCORDING TO THE TYPE OF INFERTILITY

TYPE	NO.OF CASES	PERCENTAGE
Primary	36	72
Secondary	14	28

72% of patients fall into group of primary infertility and 61% of the patients with primary infertility are in the age of 26 to 30 years.

TABLE 2: FINDINGS IN UTERUS ON HSG

Uterus	Primary infertility		Secondary infertility	
	Number	Percentage	Number	Percentage
SIZE				
Normal	34	68	14	28
Small	01	02	----	----
Large	01	02	----	----
SHAPE				
Normal	34	68	11	22
Bicornuate	02	04	01	02
Arcuate	---	----	02	04
SURFACE				
Smooth	35	70	14	28
Irregular with filling defect	01	02	----	----

TABLE 3 : TUBAL FINDINGS AND PERITONEAL SPILLAGE ON HSG

FINDINGS	PRIMARY INFERTILITY		SECONDARY INFERTILITY	
	Number	Percentage	Number	Percentage
Normal tubes with bilateral spillage	31	62	11	22
B/L blocked tubes	02	04	---	---
B/L hydrosalpinx with spillage	01	02	---	----
B/L hydrosalpinx with block	---	---	01	02
Rt block with lt spillage	01	02	---	----
Lt. block with rt.spillage	---	---	01	02
Rt hydrosalpinx with block	---	---	01	02
Lt hydrosalpinx with block	01	02	----	----

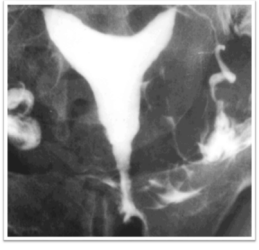
84% had patent tubes with bilateral spillage.

One patient had right fimbrial block with left spillage and one had left tubal block with right spillage , 2 cases of primary infertility were of bilateral blocked tubes 4 cases had hydrosalpinx of which one is bilateral hydrosalpinx with block, two cases had hydrosalpinx with no spill on one side and one patient had bilateral hydrosalpinx with spillage.

FIGURE : 1 [CASE:14]

HSG showing normal uterine contour with bilateral hydrosalpinx with no spillage of contrast representing bilateral block—suggestive of bilateral hydrosalpinx with block.

FIGURE: 2 [CASE: 30]



HSG showing mild and smooth indentation over fundus with normal filling and spillage of contrast from both tubes—suggestive of arcuate uterus

FIGURE :3 [REP CASE:31]

HSG showing two separate uterine horns with single cervical canal-.Fallopian tubes are well visulalized with normal spillage of contrast medium from fimbrial ends.-suggestive of Bicornuate unicollis. Filling defect noted in the right uterine horn due to air bubbles

DISCUSSION

Hysterosalpingogram, the traditional method is widely used as first line approach and still often the best clinical choice to assess the anatomy of the uterus and patency of fallopian tube in infertility evaluation.

The goal of an infertility evaluation is to provide a rationale, organised approach to diagnosis, to present an accurate assessment of progress and prognosis during the evaluation, and to offer emotional and psychological support to the couple.

Type of infertitilty

In our study primary infertility was observed in 36 patients (72%) and secondary infertility in14 patients(28%)

TABLE 4: PERCENTAGE OF PRIMARY & SECONDARY INFERTILITY IN OTHER STUDIES

	NO OF CASES	PRIMARY INFERTILTY	SECONDAR INFERTILITY
Agarwal et al[16]	100	63%	37%
Anjana et al[17]	50	58%	42%
Gokhan Goynumer et al[18].	100	69.00%	31.00%
FatemehForoozanfard et al[19]	62	69.30%	30.70%
Neerja,JainKuldeep[10]	200	75%	25%
M Heis et al[11].	281	42.30%	57.60%

Our study results are coinciding with the study done by Neerja, Jain Kuldeep et al[10].

AGE OF PATIENT:

Fertility is strongly influenced by age of the patient. In women fertility is maximal around 25 years age and after 30 years it declines rapidly. In this study: 64% of cases were between 26 to 30 years.

PERCENTAGE OF PRIMARY AND SECONDARY INFERTLITY IN PRESENT STUDY AMONG 26-30 YEARS

Percentage of primary infertility in present study among 26-30 years is 44% and percentage of secondary infertility in present study among 26-30 years is 20% According to Agrawal et al 42% of cases were between 26-30 years of which 21(33.33%) are of primary infertility and 21(56.76%) are secondary infertility. The mean age of women was 27.69±4.48 years, for primary infertility the mean age was 26.91±4.27 years and for women of secondary infertility the mean age was 29.51±4.31 years[6].

According to Anjana et al 19 cases, 38% are between 26-30 years[7]. According to M.Bukar et al 54.0% of patients are between 25-34 years[12]. The commonest age group was between 25 -34 years by Ibwelwe PC et al[13]. In comparison our results are coinciding with above mentioned studies.

CONGENITAL ANOMALIES OF UTERUS

The congenital anomalies were found in 5 cases. The most common

anomaly in this study is bicornuate uterus.

TABLE 5: CONGENITAL ANOMALIES OF UTERUS STUDIED BY HSG IN OTHER STUDIES

STUDIED BY	NO. OF CASES	% UTERINE ANOMALIES
Leena Wadhwa et al[14]	108	4.6%
Mansoureh et al[15]	100	21%
Ibinaiye et al[16]	220	2.8%
Sakar et al [17]	82	7.2%
M.Bukar et al[12]	272	3.6%
Fayez. A et al[18]	400	6%
E.Zanneti et al[19]	13470	8.6%
Present study	50	10%

Our study results are similar to the study done by E.Zanneti et al[29].

CONGENITAL ANOMALIES OF UTERUS IN PRESENT STUDY

Bicornuate uterus was found in 3 cases i.e, 6% and arcuate uterus was found in 2 cases i.e, 4% in present study.

According to Agrawal et al bicornuate uterus found in 2% cases and septate, arcuate uteri in 4% cases. According to Ibinaiye et al bicornuate uterus was found in 1.8% and unicornuate and septate uterus 0.5% each[16].

According to Sakar et al unicornuate uterus was found in 4 patients, septate uterus in one patient and arcuate uterus in one patient[17].

According to M Bukar et al bicornuate uterus was seen in 5 cases, hypoplastic uterus in 3 cases and arcuate uterus in 2 cases12.

In present study 48 cases had normal sized uterus in HSG and one had large and another small size.

TUBAL FACTORS

In present study there was tubal occlusion in 7 cases (14%). Bilateral block was observed in 3 cases (6%) and unilateral block in 4 cases (8%) Unilateral block was common.

TABLE 6: TUBAL FACTORS STUDIED BY HSG IN OTHER STUDIES

Studied By	No. Of Cases	% Uterine Anomalies
Agrawal et a[16]	100	34%
Anjana et a[17]	50	44%
Botwe BO et al[20]	1140	56%
Al Subhi T et al [21]	218	47.8%
Okafor CO et al [22]	320	43.5%
M.Bukar et al[12]	272	23.3%
Bello TO et al[23]	120	40%
Present study	50	22%

Our study results are coinciding with the study done by M.Bukar et al[12].

In the present study tubal abnormality (22%) was the most common pathology found in comparison to the uterine abnormalities which were found in 12% of cases.

In the present study hydrosalpinx was observed in 8% (4/50 cases). 2 cases were bilateral, one with left hydrosalpinx and other with right hydrosalpinx which is coinciding with the study done by Agrawal et al where hydrosalpinx was found in 8% of cases[6].

According to M.Bukar et al tubal blockage was found in 14.8% cases and hydrosalpinx in 8.5% cases[12].

According to Al Subhi T et al, the prevalence of fallopian tubal obstruction was 19.1% in the primary infertility group and 28.7% in the secondary infertility group[21].

Bilateral tubal occlusion in 43 (18.7%) and bilateral hydrosalpinges in 6 (2.6%) patients was found in a study done by Okafor CO et al[22].

COMPLICATIONS

Abdominal pain observed in 9 cases (18%).Venous intravasation noted in one patient. Air bubbles were observed in one patient. No allergic reactions noted.

PATIENT PERCEPTION

All the patients know why the examination was being performed .All the patients were given explanation before examination and in most cases this was deemed satisfactory.

CONCLUSION

Thus the evaluation of utero-tubal factors is an essential step in infertility work up. Radiological and imaging techniques give clear picture of uterus and most probable cause of infertility to the gynaecologists.

Hysterosalpingography is a safe, relatively inexpensive, simple and rapid diagnostic test, when performed properly provides valuable information about the uterine cavity and tubal architecture.

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