Detection of tubal abnormalities by HSG in Nepalese subfertile women

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ABSTRACT

Fallopian tube defects are responsible for subfertility in 12.0-33.0% of subfertile couple. Hysterosalpingography (HSG) is a safe and less invasive method of detecting both the tubal and uterine defects. The objective of this study was to find out the incidence of tubal blockage including its site and side diagnosed by HSG in subfertile Nepalese women and to find out the incidence of uterine and other abnormalities detected by this test. This was a prospective study of 1000 cases of subfertility, conducted in Om Hospital, Kathmandu. A short history and HSG report of these cases were obtained from the Radiology department of the hospital. Size and shape of the uterine cavity, evidence of cervical incompetence, tubal visualization, spillage of dye, tubal block with its side and site, evidence of peritoneal adhesion and intravasation of dye in vessels were noted. Quick spillage of the dye in the peritoneal cavity or spillage only after pushing the dye with pressure was also noted. Results were entered in simple tabulations and analyzed. Among 1000 cases, 65.8% had primary and 34.2% had secondary subfertility. 29.0% of the total 1000 cases had abnormal HSG findings. 19.0% of total 1000 cases had tubal blockage. Incidence of tubal blockage in both primary (19.1%) and secondary subfertilty (18.7%) was almost same, in contrary to previous belief. Mullerian defect was present in 3.2% of primary subfertility and 2.0% of secondary subfertility cases.Cervical incompetence was not detected in any case. Evidence of uterine infection was present in 0.7% of primary subfertility and 0.2% of secondary subfertility cases. Abnormal size of uterine cavity was present in 1.2% of primary subfertility and 0.5% of secondary subfertility. Features of phimosis of fimbrial opening, localized spill and intravasation of dye were present respectively in 5.6%, 1.5%, 1.2% in primary subfertility and 4.9%, 1.7% and 1.7% in secondary subfertility.In conclusion; the incidence of tubal blockage detectable by HSG in this study was 19.0%.

Keywords: Subfertility, Hysterosalpingograghy, tubal blockage.

INTRODUCTION

Patency of fallopian tubes is one of the prerequisites for normal human fertility. It has crucial role in picking up ovum and transporting ovum, sperms, and the fertilized zygote. However, patency alone is not enough, normal function of the tube is equally important. Fallopian tubes are vulnerable to infection and surgical damage which impair its function. Problems with tubes are responsible for subfertility in 12-33% of subfertile couple according to various studies.[1-4]

In a normal HSG, the cervical canal is spindle shaped and approximately 30-40 mm long in nulliparous women. Cervical glandular filling may be observed and the internal os may be seen as a distinct area of narrowing. The normal uterine cavity appears triangular in shape with smooth margins and measures an average 35 mm in both longitudinal and vertical dimension. Fallopian tubes are 5-16 cm long and are divided into interstitial, isthmic, ampullary and infundibular segments. Tubal blockage can be in proximal (cornual), mid or distal part of the tube.[2-4]

HSG is used to diagnose both uterine and tubal defects and abnormalities. Among uterine abnormalities, both congenital (Mullerian duct abnormality) and acquired (fibroids, polyps, synechiae and adenomyosis) can be diagnosed. Among tubal abnormalities, blockage at different sites, polyps, salpingitis isthmica nodosa (SIN) can be diagnosed. Some incidental abnormalities e.g. surgical clips, ovarian, uterine and tubal calcification and dermoid cyst can also sometimes may be detected.[2-4]

Nowadays, hysterosalpingography (HSG), hysterosalpingo - contrast sonography and laparoscopy and dye test are three tests commonly used to test tubal patency. Salpingoscopy and falloposcopy consist of high technology and are usually not done as primary tests. Among the first three tests mentioned for tubal patency, each test has its own advantages and disadvantages.

HSG is simple, safe and inexpensive. It has 65.0% sensitivity and 83.0% specificity for detecting tubal blockage.[3-10] Hysterosalpingo- contrast sonography is an alternative to HSG, by which along with tubal patency,

Table-1: Age distribution of the women with subfertility

Age group (years)	Primary subfertility with normal HSG Findings. No. (%)	Secondary subfertility with normal HSG findings. No. (%)	Primary subfertility with abnormal HSG findings N0. (%)	Secondary subfertility with abnormal HSG findings No. (%)
Below 20 (n=14)	10 (2.2%)	Nil (0%)	4 (2%)	Nil (0%)
20-29 (n=666)	351 (76.2%)	151 (60.6%)	127 (64.5%)	37 (39.8%)
30-39 (n=311)	98 (21.2%)	96 (38.6%)	64 (32.4%)	53 (56.9%)
Above 40 (n=9)	2 (0.4%)	2 (0.8%)	2 (1.0%)	3 (3.3%)
Total (n=1000)	461 (100%)	249 (100%)	197 (100%)	93 (100%)
Range	19-43 Years	21-42 years	18-43 years	22-45 years

This table shows that 64.5% of women with primary subfertility having abnormal HSG were in 20-29 age groups, whereas 56.9% of women with secondary subfertility having abnormal HSG finding were in 30-39 yrs of age group

assessment of uterine cavity and ovarian morphology also can be assessed without exposing the patient to hazards of x-ray. Laparoscopy and dye test has added advantage of diagnosing endometriosis and peritubal adhesions. The drawback of this test, is the need of general anesthesia and more sophisticated instruments, therefore usually is only recommended in doubtful cases.[2-4]

HSG is mainly indicated in cases of subfertility and recurrent miscarriage.The main complications are pain, infection, vasovagal reaction, intravasation and allergy to the contrast medium.[3,4] Pain is due to uterotubal distension or peritoneal spillage and can be minimized by slow injection and the use of isosmolar_contrast agents. Infection is rare but more common in patients with past history of pelvic inflammatory disease and hydrosalpinges. Vasovagal reaction usually occurs from rough manipulation of the cervix.Venous intravasation is of no clinical significance but can make interpretation of the images difficult. It occurs more commonly in the presence of fibroids or tubal obstruction. Allergic reaction to contrast medium is very rare.

The objective of this study was to find out the incidence of tubal blockage including its site and side diagnosed by HSG in subfertile Nepalese women and also to find out the incidence of uterine and other abnormalities detected by this test.

MATERIALS AND METHODS

This was a prospective study conducted in Om hospital, Kathmandu, the biggest subfertility centre of Nepal, where in vitro fertilization (IVF) facility is also available. Hysterosalpingography was performed to check the tubal patency in all women who attended gynae out patient department of this hospital with the complaint of inability to conceive even after one year of regular unprotected sex.

HSG was done on 7-10th day of menstrual period after complete cessation of bleeding. The lady was advised to avoid unprotected intercourse from the 1st day of period till the day of HSG, to avoid any risk of pregnancy. Ten ml of 76.0% Urograffin was used as a contrast medium. Leech Wilkinson cannula was used to inject the contrast in uterine cavity. The contrast was pushed slowly under fluoroscopic control, until the uterine cavity was distended, the tubes filled and contrast seen to spill freely from the distal ends of the tubes. Two x- ray films were taken, the first one during the early filling phase to ensure that small filling defects are not obliterated and second one after complete filling of the tubes to demonstrate free peritoneal spill.

Size and shape of the uterine cavity, evidence of cervical incompetence, tubal visualization, spillage of contrast on either side, tubal block with its site, side and evidence of peritoneal adhesion, intravasation of dye in vessels were noted. Quick spillage of dye in the peritoneal cavity or spillage only on pushing the dye with pressure was also noted. A short case record including obstetric history and HSG report were obtained from Radiology Department of the hospital after taking permission from the clinical director, executive director and head of the department of Radiology.

Table-2: Side and site of tubal blockage in primary subfertility

Site of the tube/Side → ↓	Bilateral blockage	Right tube blockage	Left tube blockage	Total (%)
Cornual end block	13	29	15	57 (50.0%)
Distal half block	3	1	17	21 (18.5%)
Fimbrial end block	15 (2 with dilated tubes)	14	7	36 (31.5%)
Total	31	44	39	114 (100.%)

Above table shows that Right sided tubal block and fimbrial end block were more common in cases of primary subfretility

Table-3: Side and site of tubal blockage in secondary subfertility

Site of the tube/Side⟶	Bilateral blockage	Right tube blockage	Left tube blockage	Total (%)
Cornual end block	13	9	9	31 (51.7%)
Distal half block	3	0	1	4 (6.6%)
Fimbrial end block	7*	10	8	25 (41.7%)
Total	23	19	18	60 (100.0%)

*includes one case with fimbrial block at one side and cornual block on the other.

Above table shows that bilateral tubal block and cornual end block were common in cases of secondary subfertility

Informations from 1000 cases were entered in simple tabulation and analyzed.

RESULTS

Total No of cases were 1000, among which 658 (65.8%) had primary subfertility and 342 (34.2%) had secondary subfertility.

In this study, out of 1000 cases (primary subfertility-658, secondary subfertility-342), 710 (71.0%) cases had normal HSG findings and 290 (29.0%) cases had abnormal findings.

In 658 primary subfertility cases, 461 (70.0%) had normal findings and 197(30.0%) had abnormal HSG findings. Among 342 cases of secondary subfertility, 249(72.8%) had normal findings and 93 (27.2 %) had abnormal HSG findings.

Out of 197 abnormal HSG in primary subfertility group, 114 cases had tubal block and 36 cases had uterine defect. In these 36 cases, 12 cases had tubal block also. So altogether 126 cases (19.1%) of primary subfertility cases had tubal block either on one side or both sides.

Among 93 abnormal HSG in secondary subfertility, 60 cases had tubal block and 10 cases had uterine defect. Among these 10 cases, 4 cases had tubal block also. So total 64 cases (18.7%) of secondary subfertility cases had tubal block.

DISCUSSION

Altogether 19.0%, 190 (126 primary subfertility and 64 secondary subfertility) cases out of 1000 cases showed tubal blockage which was similar to previous studies[1-10]

The incidence of tubal block was almost same in both primary subfertility and secondary subfertility group,which was contrary to previous findings.[11] which says that incidence of tubal block was more in secondary subfertility than primary subfertility. This may be due to increase in the incidence of STD due to change in sexual behavior of young generation.

Twenty one cases (3.2%) of total primary subfertility , 7 (2.0%)of total secondary subfertility cases showed Mullerian duct defect which was similar to 2-4% quoted in other studies.[2-4,12,13]

In this study, not a single case of cervical incompetence was detected in any group.

Table-4: Types of uterine abnormalities

Type of abnormality	Primary subfertility	Secondary subfertility
Unicornuate uterus	12 (7 bilateral tubes patent, 3 bilateral block, 2 unilateral block)	4 (2 bilateral patent tubes, 2 bilateral blocked tubes)
Bicornuate uterus	9 (6 bilateral patent tubes, 2 bilateral block, 1 unilateral block)	3 (1 bilateral block, 1 unilateral block, 1 bilateral patent)
Small uterine cavity	5 (bilateral patent)	2 (bilateral patent)
Large uterine cavity	3 (1 bilateral block with multiple fibroids detected on USG,1bilateral patent and 1 unilateral block)	nil
Irregular uterine cavity	5 (3 bilateral patent and 2 bilateral block)	1(bilateral patent)
Total	36 (12 tubal defect) (5.4%) out of 658 cases	10 (4 tubal defect) (2.9%) out of 342 cases.

Above table shows that uterine abnormalities were commonly seen in cases of primary subfertality

Table-5: Miscellaneous findings

Findings	Primary subfertility	Secondary subfertility
Phimosis of tube	37 (25 bilateral minimal spill, 12 minimal spill on one side and free spill on other side)	17 (5 bilateral minimal spill, 12 free spill on one side and minimal spill on other side)
Localized Spill	10 (8 bilateral, 2 unilateral with free spill on other side)	6 (3 bilateral, 3unilateral,with free spill on other side)
Intravasation (this finding was present along with other findings)	8 (5 bilateral block, 2 unilateral patent and 1 bilateral phimosis of fimbrial end)	6 (4 bilateral block , 2 unilateral block)

Irregular uterine cavity which is a sign of infection[14] was present in 5 (0.7%) cases in primary and 1 (0.2%) in secondary subfertility group. Large and small uterine cavity may be present due to presence of fibroid or adenomyosis or sometimes from birth,[2-4] It was present in 1.2% cases of primary subfertility and 0.5% in secondary subfertility group.

Phimosis (narrowing) of fimbrial opening which is a sign of infection[2-4,15] and detected by late and slow spillage of dye from the fimbrial end was present in 5.6% cases of primary and 4.9% of secondary subfertility.

Localized spill, a sign of peritubal adhesion was present in 1.5% of primary and 1.7% secondary subfertility cases.[2-4,15] Localized spill sometime may be confused with hydrosalpinx which can be differentiated by doing angulated x-ray film.

Intravasation of dye was present in 1.2% of primary and 1.7 % of secondary subfertility cases and in all cases some sort of tubal blockage was present. In cases with patent tubes this finding was not detected.

Detection of site of the tubal blockage helps in deciding further management of the cases. Specially cornual tubal blockage which can be corrected by various hysteroscopy guided techniques. In present study, half of the tubal block was in the cornual end. Many of them could be just due to spasm of the tube. These false positive cases can be decreased by proper counseling, gentle handling and prior injection of Hyoscine to the patient but cannot be totally eliminated.[16]

In this study, endometrial and tubal findings were not compared with hysteroscopic, laparoscopic or salpingosonographic findings, therefore sensitivity, specificity, positive or negative predictive values cannot be predicted.

Comparative study among HSG, salpingosonography, hysteroscopy, laparoscopy and dye test should be done, so that sensitivity and specificity of all these tests can be compared and the exact incidence of tubal and Mullerian defect can be predicted.

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