

## The role of hysterosalpingography in cases of subfertility

Poonam

Department of Obstetrics and Gynaecology, BPKIHS

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### Abstract

**Introduction:** Subfertility is the inability of a couple to conceive even after one year of regular unprotected coitus. The desire of woman for children is great, sometimes greater than self-interest in beauty and figure and may be stronger than the claims of a career. Considering the social stigma attached to subfertility, a sympathetic and a carefully balanced therapeutic approach to their problem is required.

**Aims and objectives:** The present work has been undertaken with a view to assess the role of HSG in the evaluation of subfertility.

**Material and method:** For the present study, a total of 105 infertile patients were selected from the outpatient department of Obstetrics and Gynaecology, Darbhanga Medical College and Hospital, Darbhanga. Only those cases were selected where the couples were in the fertile age group of and were living together for two or more years. The patients were advised to take 600mg ibuprofen, an hour before the procedure to ease the cramps. A catheter was inserted through the cervical canal, and radio-opaque dye (urograffin 76%) was passed through it. A radiograph was taken after injection of two ml. of medium to ensure that there was no filling defect in the uterine cavity which, otherwise, would be concealed by overdistending the uterus. Further injection outlined the Cornua, isthmus and ampullary portions of the tube and evaluated the degree of spillage.

**Results:** Of the total number of cases, abnormal HSG findings were seen in 55 patients. Majority of the patients were between 26-30years age group with 6-10 years duration of subfertility. The tubes were occluded in 34.28% of cases in the ratio of 1:8, proximal occlusion being the commonest. 5.71% showed hydrosalpinx. Beaded & wiry appearances of tubes were seen in 2.85% of cases. Amongst the uterine anomalies, which accounted for 20% of cases, only five patients had acquired abnormality. In the congenital group maximum number of patients had hypoplastic uterus (52.38%) followed by bicornuate uterus. Unicornuate and arcuate uterus accounted for 9.52% each. Intravasation of contrast occurred in two patients.

**Conclusion:** Hysterosalpingography plays an important role in the initial diagnostic assessment of female subfertility. Other than being diagnostic, it can prove to be therapeutic also<sup>10</sup>. An accurate interpretation of the hysterosalpingogram is necessary for the initial subfertility workup. Knowledge of these entities is important to avoid the practice of unnecessary and sometimes more aggressive procedures

**Key words:** Hysterosalpingography, Subfertility

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Subfertility is the inability of a couple to conceive even after one year of regular, unprotected coitus<sup>1</sup>. The desire of woman for children is great, sometimes greater than self-interest in beauty and figure and may be stronger than the claims of a career. The greatest tragedy that can befall on a married woman is childlessness. The child gives a permanent bonding to a marriage. Considering the social stigma attached to subfertility, a sympathetic and a carefully balanced therapeutic approach to their problem is required. Each patient requires to be thoroughly investigated, to determine the underlying factors responsible for subfertility.

**Aims and objectives:** The present work has been undertaken with a view to assess the role of HSG in the evaluation of subfertility.

### Material and methods

For the present study, a total of 105 infertile patients were selected from the outpatient department of Obstetrics and Gynaecology, Darbhanga medical college and hospital, Darbhanga. Only those cases were selected where the couples were in the fertile age group of 16 to 45 years and were living together for two or more years. The initial evaluation of patients included a detailed history, a complete general, physical, systemic and local pelvic examination.

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### Correspondence

Dr. Poonam  
Associate Professor,  
Department of Obstetrics & Gynaecology  
Manipal College of Medical Sciences, Pokhara-Nepal  
Email: yoginileo@yahoo.com

The patients were advised to take 600mg ibuprofen, an hour before the procedure to ease the cramps. After draping the position of the uterus was confirmed. A sterile Sim's speculum was applied in the vagina and the cervix caught hold with a tenaculum. Before inserting the red rubber catheter (which tightly fitted the internal os) through the cervical canal, the dye was passed through the catheter to expel the air and minimize or eliminate the air bubbles. Thereafter, the radio-opaque medium (20ml of urograffin 76%) was injected slowly under fluoroscopic guidance. The speculum was pulled out of vagina before radiographs were taken to avoid the cervix and vagina from being obscured. A radiograph was taken after injection of two ml. of medium to ensure that there was no filling defects like polyps, or submucous myomas in the uterine cavity which otherwise would be concealed by overdistending the uterus. Further injection outlined the cornua, isthmus and ampullary portions of the tube and evaluated the degree of spillage.

**Results**

In the present study of 105 patients, fifty cases had normal HSG. Abnormal HSG findings accounted for more than fifty percent of the total cases. The reason behind this could be that the hospital being a tertiary centre, cases were referred from the periphery after being initially evaluated.

In Table 2, amongst the total cases studied, seventy five patients had primary and thirty patients had secondary subfertility. This correlates well with the findings of 73.21% for primary and 26.69% for secondary infertility cases reported by Shah et al 1991. Out of 30 twelve patients had no live issue. Amongst these 8 patients had one abortion and four patients had 2 abortions each. Two patients in this

group were para3, seeking treatment to have a male child.

Table 3 shows that the majority of cases belonged to 26-30 years age group. Only those cases were selected where the couples were in the reproductive age group and were living together for two or more years. The youngest patient was 19years and the oldest was 39 years.

In the present study 21 cases (20%) had congenital anomalies whereas only five (4.37%) entered the list of acquired abnormalities. Hypoplastic uterus was the commonest congenital anomaly detected with ten patients from primary & one from secondary infertility group (with a miscarriage at 16 weeks). All patients with bicornuate uterus had secondary infertility and those with unicornuate uterus had primary infertility.

There was only one patient with a filling defect (Table 5). She was a Para 2 with 2 abortions with h/o severe dysmenorrhoea and menometrorrhagia (USG showed a submucous fibroid).Both the cases with deviated uterine cavity had ovarian cyst ( confirmed by USG).The one with uterine synechia had one child with subfertility of greater than 10 years. She had a past h/o tuberculosis.

PID was one of the most frequent causes of tubal blockage. Out of which twelve patients were from primary infertility group. Unilateral hydrosalpinx was more in number<sup>4</sup> than bilateral hydrosalpinx<sup>2</sup>.Two of the three patients with beaded &wiry appearance had simultaneous tuberculous chest infections. This appearance of tubes is characteristic of tuberculosis. Peritubal adhesion occurred with hydrosalpinx in one case, with tubal occlusion in two cases and with fibroid in one case.

**Table1:** Showing the number of normal and abnormal HSG findings

N=105	Normal HSG=50	Abnormal HSG=55
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**Table 2:** Showing the incidence of primary and secondary Subfertility

Type of Subfertility	n=105	Percentage
Primary	75	71.42%
Secondary	30	28.57%

**Table 3:** Age wise distribution of patients

Serial No.	Age group	No. of cases	Percentage
1	16-20	10	9.52%
2	21-25	25	23.80%
3	26-30	54	51.42
4	31-35	14	13.33%
5	36-40	2	1.90%
Total	-	105	100%

**Table 4:** Showing types of congenital abnormalities detected by HSG

Serial No.	Congenital abnormalities of	No. of	Percentage
1	Hypoplasia	11	52.38%
2	Uterus bicornis unicollis	6	28.57%
3	Unicornuate uterus	2	9.52%
4	Uterus diadelphus	-	-
5	Arcuate uterus	2	9.52%
	Total	21	100

**Table 5:** Showing types of acquired abnormalities detected by HSG

Serial No.	Acquired abnormalities of uterus	No. of	Percentage
1	Filling defect	1	20%
2	Deviation of uterine cavity	2	40%
3	Uterine synechia	1	20%
4	'T' shaped uterus	1	20%
	-	-	-
	Total	5	100%

**Table 6:** Showing the different types of tubal abnormalities detected by HSG

S. No	HSG Findings	No. of cases	percentage
1	Tubal occlusion	36	34.28%
2	Hydrosalpinx	6	5.71%
3	Beaded and wiry appearance of tubes	3	2.85%
4	Peritubal adhesions associated with other abnormalities	4	3.80%
5	Normal tubal findings	56	53.33%

**Table7:** Shows the incidence of proximal and distal tubal occlusions

Serial No	Type of occlusion	No. of cases	Percentage
1	Proximal	32	88.88%
2	Distal	4	11.11%
	Total	36	100

## Discussion

Subfertility means the inability of a couple to conceive. In case of women, it is the inability to conceive and in case of men it is the inability to procreate. A healthy couple takes on an average, a year to conceive a pregnancy.

In spite of the increased subfertility services rendered these days, its prevalence still remains around 10-15%. About 40-45% cases are attributed to the female factor, 25-40% cases to the male factor, 10% to both male & female factor with 10% cases still remaining unexplained. Assessment of the six most common factors causing subfertility should be performed during the initial clinical evaluation. These six factors include the cervical factor, endometrial-uterine factor, tubal factor, ovarian factor, peritoneal factor and male factor. A subfertility workup is incomplete without an initial HSG.

In the present study of 105 patients, fifty cases were normal. Abnormal HSG findings accounted for more than fifty percent of the total cases. The reason behind this could be that the hospital being a tertiary centre, cases are referred from the periphery after being initially evaluated. Amongst the total cases studied, seventy five patients had primary and thirty patients had secondary subfertility. The majority belonged to 26-30 years age group. About 48.57% of the studied cases majority had 6-10 years duration of subfertility followed by 3-5 years duration. This long duration could be due to the hesitancy of couples in seeking early advice. Unawareness of the importance of early treatment could be another factor contributing to such long durations of subfertility. The maximum numbers of abnormalities also are seen in the same group i.e. 6-10 years duration. Probably because the largest number of patients seeking advice are from this group. HSG provides useful, although indirect, information outlining the uterine cavity and the fallopian tubes. It has been reported to have a high sensitivity, but a low specificity especially in the diagnosis of uterine cavity abnormalities<sup>2,3</sup>.

In the present study 21 cases (20%) had congenital anomalies whereas only five (4.37%) entered the list of acquired abnormalities. Errors in the course of development of the müllerian apparatus lead to different types of malformations of the uterus. Müllerian anomalies have been associated with many obstetrical complications, such as: recurrent pregnancy losses, ectopic gestations, premature rupture of membranes, preterm labour and delivery, and foetal malpresentation<sup>4,5</sup>. The hysterosalpingographic appearance of uterus was

studied at different periods of intrauterine life. It was observed that, at about the seventh week of intrauterine life, two uteri and two vagina can be seen normally. In the third month, the two vaginae fuse to form a single canal, but the two separate uteri and cervix still remains. At about the fourth month, uterus bicornis is seen. Single vagina and uterus can be seen from the fifth month onwards<sup>6</sup>. In infants and children the cervix is longer than the uterus. There are wide variations in the normal HSG findings.

In the present study, amongst the congenital malformations, there were 11 patients with hypoplasia, 6 with bicornuate uterus, and two each with unicornuate and arcuate uterus. The common clinical manifestations of hypoplastic uterus include a rudimentary horn, an infantile or pubescent uterus or an infantile cervix presenting as a slender conical structure with a pinpoint os. The uterocervical length is less than 5cm. The endometrial lining is scanty. The fallopian tubes appear elongated, thin and wavy in outline with poorly developed plicae. None of the patients under study had uterus diadelphis.

Amongst the acquired abnormalities, two cases were of deviated uterine cavity (due to ovarian cyst-later confirmed by ultrasonography), and one each of filling defect, uterine synechia and 'T' shaped uteri. Tumours projecting into the uterine cavity may cause actual filling defect, which can be detected by HSG. This filling defect can be distinguished from intrauterine synechia by the fact that under fluoroscopy, the size of the filling defect due to a tumour will diminish on further injection of the medium but not in case of synechia<sup>7</sup>. Thus small tumours can be seen which might have been missed during clinical examination. Large fibroids often produce extreme distortion of the uterine cavity. When myomectomy is planned HSG is of great value in visualizing the uterine cavity and fallopian tubes. The case with uterine synechia had a history of tuberculosis. In patients taking oral contraceptives for long periods, a small T-shaped uterus can be observed, characterized by a 1:1 ratio between the uterine body and the cervix, which are the normal proportions of a premenarchal uterus. This appearance can also be observed in adult women with severe oestrogen deficiencies in which the uterus fails to attain postpubertal proportions because of the absence of normal oestrogen stimulus<sup>8</sup>.

Normal tubal findings were present in 56 out of 105 cases which accounts for 53.33% of cases. Amongst the different tubal abnormalities, tubal occlusions reigned supreme with the incidence of 34.28%. There

was a preponderance of proximal tubal block (88.88%). However no significant difference was found between the right or the left side. Tubal pathology with tubal blockage due to PID is one of the most frequent causes of subfertility in women. Proximal, distal and peritubal damage can be caused by a number of pathological processes, such as inflammation, endometriosis and surgical trauma<sup>9</sup>. Uterine irritability due to infection, organic disease etc. close the uterotubal junction temporarily. Similarly spastic condition of the sphincter also closed the cornua. This region does not undergo the normal cyclical changes of the endometrium. As such it becomes prone to infection, the infecting organism getting a relatively permanent nidus, thus favouring fibrosis and occlusion. Hydrosalpinx, not detected by pelvic examination can be diagnosed by HSG. In the present study 5.71% of the cases had either unilateral or bilateral hydrosalpinx. This appears as a localized collection of the contrast medium which gradually increases in size. Hydrosalpinx is usually produced as a result of catarrhal inflammation of the tube following infections like gonococcal or tuberculous of the genital tract. Eventually the fimbrial end closes by adhesions. The secretions are retained in the lumen and the tube gradually distends.

2.85% of the cases had beaded and wiry appearance of the tubes which is a characteristic finding in later stages of genital tuberculosis involving the tubes. Scarring of the fistula or abscess like cavities in the tubal wall gives this appearance. Two of the three cases in this series had simultaneous Koch's chest also. Venous or lymphatic intravasation can occur in up to 6% of patients undergoing hysterosalpingography<sup>8</sup>. Although it can occur in healthy patients, there are some predisposing factors such as recent uterine surgery or increased intrauterine pressure because of tubal obstruction or excessive injection pressure<sup>2,3,8</sup>. The radiographic appearance of early intravasation is characterized by filling of multiple thin beaded channels and an ascendant course. When intravasation is recognized, the injection should be stopped if an oil-soluble medium has been used. Venous intravasation is innocuous as long as a water-soluble contrast medium is used.

## Conclusion

Hysterosalpingography plays an extremely important role in the diagnostic assessment of female subfertility. Other than being diagnostic, it can prove to be therapeutic also<sup>10</sup>. An accurate interpretation of the hysterosalpingogram is necessary for the initial subfertility workup. Knowledge of these entities is important to avoid the practice of unnecessary and sometimes more aggressive procedures.

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