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RESEARCH ARTICLE

THE VALIDITY OF HYSTEROSALPINGOGRAPHY VERSUS LAPAROSCOPY IN THE DIAGNOSIS OF TUBAL FACTORS IN THE INFERTILE WOMEN IN MOSUL

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ABSTRACT

Objective: To define the tubal factors as a cause of female infertility and compare between HSG and laparoscopy as valid diagnosis for tubal disease. **Study setting:** Infertility centre at Al-Batool Teaching Hospital in Mosul. **Design:** Descriptive case serial study. **Study Participant:** Three hundred infertile women attending Al-Batool infertility centre in Mosul. **Intervention:** (300) infertile women enrolled for this study from November 2006 to May 2008 (1.5 years), their age were between 17-43 years old. All the patients were evaluated by full history, medical and social, complete physical examination and investigation that include tests for ovulation, hormonal assay, Hysterosalpingography to detect tubal patency and laparoscopy once indicated. Both partners are seen at the initial visit. **Main measures:** evaluation of tubal patency, associated pelvic and peritoneal disease and to compare the validity of HSG versus laparoscopy in the diagnosis of tubal factor in the infertile women. **Results:** this study revealed that tubal factor was accounted for to 28.67% of female infertility, mainly in primary infertility in 72% of patients for a duration for more than 3 years of infertility. The site of obstruction in the right tube in 37% in compare to left tube in 23% of patients and distal more than proximal tubal obstruction in 59.31% and 40.69% respectively. The accuracy of HSG versus laparoscopy in the diagnosis of tubal factors in female infertility was in a sensitivity of 71.79% and a specificity of 95.53%. **Conclusion:** When comparing HSG and laparoscopy, laparoscopy should be considered as more perfect in the diagnosis of tubal pathology in the infertile women.

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INTRODUCTION

Patent fallopian tubes are a pre requisite for normal human fertility. However, patency alone is not enough, normal function is crucial. Although patients often view them as either open or "blocked," the fallopian tubes are highly specialized organs. They have a critical role in picking up eggs and transporting eggs, sperm, and the embryo. The fallopian tubes are also needed for sperm capacitation and egg fertilization. Because the egg is fertilized in the fallopian tubes and the first stages of development of the embryo occur during its four day journey to the uterine cavity, the tubes are also important in nutrition and development. The fallopian tubes are vulnerable to infection and surgical damage, which may impair function by affecting the delicate fimbriae or the highly specialized endosalpinx. A fallopian tube obstruction occurs in 12% to 35% of infertile couples (Peter Braude and Alison Tylor, 2003).

Causes of tubal damage

Infection: Pelvic infection is a major cause of tubal sub fertility. Infective tubal damage can be caused by sexually transmitted diseases, or can occur after miscarriage, termination of pregnancy, puerperal sepsis or insertion of an intrauterine contraceptive device.

Endometriosis: Complete tubal occlusion is rarely caused by pelvic endometriosis. Tubal distortion and limitation of fimbrial mobility caused by the associated pelvic adhesions is more likely.

Surgery: Previous laparotomy is a recognized risk factor for tubal sub fertility as rupture appendix,tubal surgery or ectopic pregnancy (Peter Braude and Alison Tylor, 2003).

Diagnosis: Evaluation of tubal factors include Hysterosalpingography: In 1920, Rubin introduced the tubal insufflation test using carbon dioxide to investigate tubal patency. In 1925, Heuser performed the first hysterosalpingography with oil soluble contrast media. Is performed after cessation of menstrual blood flow using an occlusive cannula that placed in the cervix. And instillation of a radiopaque dye followed by image intensification under fluoroscopy. Selected radiographs are taken usually three. Anesthesia generally is not required. A water-soluble dye is used to confirm tubal patency because of the adverse effects of

sequestration of an-oil based dye within the lumen they mistake an occluded tube (Neville *et al.,* 2004). HSG provides visualization of the internal contour of the uterine cavity, tubal pathology, synechiae, congenital anatomic anomalies and fibroids if they distort the uterine cavity. This method neither allows for visualization of the external surface of the tube nor provides external assessment of pelvic adhesions or anatomic relationships within the pelvis. HSG is usually obtained before performing a laparoscopy as it is less costly and less invasive (Mark Morgan, 2005). Laparoscopy, The first gynecologic laparoscopy was performed by Raoul Palmer in 1944. About 25 years later, in the late 1960s, the diagnostic laparoscopy became a routine procedure in gynecological practices. Is the gold standard for diagnosing tubal and peritoneal disease, it allows a careful assessment of the architecture of the tubes, in particularly visualization of the fimbria, assesment of all the pelvic organs, permits detection of intra mural and subserosal fibroids, peritubal, periovarian adhesions and endometriosis. Also detection of tubal patency at laparoscopy by observation of the passage of dye, such as methylene blue or indigo carmine, through the fimbrial opening. of the tubes (Mark Morgan, 2000). The finding at laparoscopy agree with those of HSG in two-third of the cases, the major area of disagreement is the failure of the HSG to detect pelvic adhesions or endometriosis also these abnormalities can be treated through laparoscopy either by lysis,salpingostomy,or fulguration or vaporization of implants of endometriosis (Leon Speroff *et al.,* 1999). Hysteroscopy allows for direct internal inspection genital cavities, many abnormalities, including synechie, fibroids, polyps, and septae can be surgically corrected at the time of hysteroscopy.

Aim of the study

- Evaluation of the prevalence of tubal factor as a cause female infertility.
- Compare the validity of HSG versus laparoscopy in the diagnosis of tubal factor in the infertile women.

MATERIALS AND METHODS

The total number of patients attending Al-Batool Teaching Hospital infertility centre is (8856) patient. The number of patients enrolled for the study was (300) from November 2006 to May 2008.their ages were between 17 and 43 years old (mean age 26.8±2.6). All the patients were evaluated by history, physical examination and investigations included tests for ovulation, hormonal analysis, Hysterosalpingography for tubal patency and laparoscopy.

Laparoscopy was performed for patients with:

- Abnormal findings at Hysterosalpingography
- Unexplained infertility more than three years.
- Positive history of genital infection or pelvic inflammatory disease.
- Positive gynecological history such as dysparunia, severe dysmenorrhoea.
- Positive findings on pelvic examination such as painful vaginal examination or indurations (Amal, 2001)

RESULTS

This study showed that tubal factor accounted for 28.67% of female infertility (Table 1). primary infertility in 216 patient=72% of patients Secondary infertility in 84 patient= 28% of patient (Table 2). Tubal factors more in female age between 20-30 years old (Table 3). The duration more with duration of infertility more than 3 years (Table 4). Positive findings in HSG in 64 patient account for 21.66% of patients (Table 5). While positive findings in Laparoscopy in 104 patient account for 34.66% of infertile women (Table 6). The site of obstruction:- Bilateral tubal obstruction in 35 patient = 40% of patients Unilateral tubal obstruction in 53 patient, Right tubal obstruction in 31 patient account for 37% of patients Left tubal obstruction in 21 patient account for 23% of patients. (Table 7). The position of tubal obstruction more distal than proximal tubal obstruction in 59.31% and 40.69% respectively (Table 8). There is associated lesions with tubal disease diagnosed during laparoscopy mostly endometriosis and pelvic adhesions (Table 9). The accuracy of HSG versus laparoscopy in the diagnosis of tubal factors in female infertility (Table 10). Sensitivity 71.79%, Specificity 95.53%, (Table11).

Table 1. Causes of female infertility

%	Number of patient	Cause of infertility
37.99%	114	Endocrine
28.67%	86	Tubal factor
11%	33	Endotmetriosis
2.34%	7	Congenital uterine abnormality
7 .32° o	2 2	Cervical cause
12.68%	38	Multiple aetiology
100%	300	Total
%	Number of patient	Cause of infertility
37.99%	114	Endocrine
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12.68%	38	Multiple aetiology
100%	300	Total

Table 2. Type of female infertility

Type of infertility	Number of patients	%
Primary infertility	216	72%
Secondary infertility	84	28%
Total	300	100%

Table 3. Relation of tubal factors to the female age

Female age in years	Number of patients	%
15-20	30	10%
21-25	95	31.66%
26-30	105	35%
31-35	30	10%
36-40	25	8.34%
41-44	15	5%

Table 4. Relation of tubal factor to the duration of infertility

Duration of infertility in years	Number of patients	%
1-3 ys.	116	38.67%
4-6 ys.	132	44%
7-9 ys.	31	10.33%
13 ys.	21	7%
Total	300	100%

Table 4.

Finding	Number of patient	%
Normal	236	78.66%
Abnormal	64	21.34%
Total	300	100%

Table 6. Results of laparoscopy

No tubal disease	214	71.33%
Tubal disease	86	28.67%
Total	300	100%

Table 7. Sites of tubal obstruction diagnosed by laparoscopy

Bilateral tubal obstruction	33	40%
Unilateral tubal obstruction	53	**37 %**
Right tube	32	
Left tube	21	23%
Total	86	100%

Table 8. Sites of tubal obstruction by laparoscopy

Position	Number of Patients	**%**
Proximal tubal obstruction	35	40.69%
Distal tubal obstruction	53	59.31%
Total	86	100%

Table 9. Associated lesions diagnosed by laparoscopy

Associated lesions	Number of patients	%
Endometriosis	33	38.3%
Pelvic & peritoneal adhesions	33	38.3%
Leiomyomas	10	11.5%
Dermoid cyst	1	1.2%
Congenital abnormalities	7	8.3%
Normal pelvis	2	2.7%
Total	86	100%

Table 10. Comparisn between HSG versus Laparoscopy in detecting tubal pathology

True +ve	False+ve	
56	8	**64**
False –ve	True –ve	
22	214	236
Total		300

Table 11. Accuracy of HSG compared to Laparoscopy

Sensitivity	71.79%
Specificity	95.53%

DISCUSSION

Problems with fallopian tubes are responsible for up to one third of cases of female infertility (Keith Edmonds, 2007). tubal affection can result in either partial or total tubal occlusion as distal portion of the tube is commonly affected as that found in my study, fluid can accumulate within the tubes causing a hydrosalpinx. Functional competence of fallopian tubes implies not just patency but also the integrity of the mucosal lining of the endosalpinx. Although HSG is simple, inexpensive, outpatient x-ray contrast procedure that gives uterine cavity information, tubal patency can be tested but it is not particularly sensitive for mild distal tubal disease or endometriosis (Ben *et al.,* 1999; Proefschrift *et al.,* 2006). The sensitivity in my study was 71.79% which in higher than the study done by D.A.M. Perquin Which is 65% and the specificity is higher in my study which is 95.53% compared to the study done by D.A.M. Perquin which is 83%. Laparoscopy is the gold standard for diagnosing tubal and peritoneal disease; it is a day surgery procedure, done under general anesthesia, it shows the outer uterine contour only (unless with hysteroscopy), it shows the appearance of the tubes and their patency, also appearance of ovaries and pelvic peritoneum. It is a definitive test, can diagnose distal tubal disease and endometriosis can be diagnosed and treated. In my study one side tubal abnormality was higher than two sided tubal abnormality compared to the study done by D.A.M. Perquin. That showed one-sided abnormalities less than two-sided abnormalities. In my study tubal abnormality was higher in right tube more than left tube which is the same result to the study done by (Severi *et al.,* 2007; Ben *et al.,* 1999).

Conclusion

When comparing HSG and laparoscopy, we should keep in mind that both procedures provide more information about the condition of the Fallopian tubes. Whereas HSG provides information on the status of the intrauterine cavity, laparoscopy allows inspection of the intra-abdominal cavity, for instance to see if endometriosis is present. So that early laparoscopy is not routine, for tubal assessment it is wise to begins with HSG and proceeds to laparoscopy when indicated. For clinical practice, we recommend that laparoscopy can be postponed until at least 10 months after a normal or one-sided abnormal HSG, whereas laparoscopy provides useful information immediately after a two-sided abnormal HSG.

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