

Intra-Operative Dye Tests Done during Myomectomy to Confirm Hysterosalpingographic Finding of Bilateral Tubal Blockage

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Abstract

Introduction: The standard full complement for the investigation of an infertile couple in our environment can be very expensive. This usually necessitates that for a few couples investigating them maybe individualized based on their financial capability. Hysterosalpingography (HSG) and laparoscopy are the two classic methods available for evaluation of tubal pathology which is the commonest cause of infertility in Nigeria. However, while these tests can be complimentary it is usually common practice to reserve laparoscopy and dye test for women with inconclusive HSG or does with signs of tubal obstruction. An Intra-operative dye test is usually for patients' under-going myomectomy to confirm patency of the fallopian tubes.

Aim: The study aims to find out if an intra-operative dye test has a higher accuracy as compared to a preoperative HSG in determining tubal blockage.

Methods and materials: It were a retrospective study carried out in university of Abuja teaching hospital. The case folders of all women who had myomectomy with an intra-operative dye test between January 2017 and May 2019 were retrieved and analyzed for data. A total of 187 myomectomies were done. Seventy-two of these cases had an intra-operative dye test done alongside to confirm the Hysterosalpingograph finding of bilateral tubal blockage.

Results: The age range with the highest number of visits to the clinic were between 30-34 years with 62.5% attendance. Nulliparous patients were more frequently seen at the clinic with 56 patients seen making 77.8% while multiparous patients were 16 in number making 22.2%. The intra-operative dye test was able to confirm 8 patent tubes out of the 72 which the HSG had suggested bilateral tubal blockage giving it an accuracy of 88.9%.

Keywords: Myomectomy • Hysterosalpingograph • Intra-operative dye test • Outcome

Introduction

Infertility, defined as inability of a couple to conceive after one year of regular, unprotected coitus, affects 10%-15% couples in the developing countries [1]. It is estimated that 30%-40% of couples in the developing countries will go through their reproductive years without having a child [1]. However, developments in investigations and treatment offers new hope for such couples.

Tubal and peritoneal factors account for 30%-40% of cases of infertility in our environment, a reflection of the high incidence of Pelvic inflammatory disease in our women. An incidence of 45% was reported in Jos while another study reported that tubal disease was responsible for 40% of infertility [1-3].

While the prevalence of infertility has remained stable over the last 40 years, the demand for evaluation and treatment has increased considerably [1].

In evaluating women for infertility, a hysterosalpingogram is a useful tool in determining the shape and size of the uterine cavity as well as the patency of the fallopian tubes [3]. Its limitation is in its inability to evaluate peri-tubal adhesions and endometriosis as well as inability to determine the state of the adnexa [3]. It is an out-patient procedure which entails cannulation of the cervix, instillation of contrast media through the uterine cavity to the fallopian tubes, followed by at least 3 X-Ray film shots (scout, uterine contour and tubal patency, post evaluation).

It is a safe, inexpensive, simple, rapid diagnostic test that can reveal the shapes of the uterine and tubal lumens [2,3]. Important information becomes available to aid in the management of the infertile couple by using proper precautions, careful techniques, and intelligent analysis of the findings.

Materials and Methods

At the university of Abuja teaching hospital, hysterosalpingograms are an important component of infertility investigations. Hysterosalpingograms are usually done in the first half of the menstrual cycle, before the tenth day, without anesthesia while using 15 ml of Urografin as contrast media. Three radiograms are then taken.

Apart from being a diagnostic tool, some authors ascribe a therapeutic value to the procedure as a number of infertile women have gone on to conceive after having a hysterosalpingography [4,5].

Laparoscopy and dye test is another procedure very useful in the evaluation of an infertile woman and it is suggested to be the gold standard for evaluating tubal and peritubal pathologies [6-8]. With the aid of a laparoscope the surgeon is able to view the spill of the dye into the peritoneum, peritubal and adnexal structures and also visualize the stigmata of ovulation on the ovaries. It has the advantage over a hysterosalpingogram in that it provides an excellent visualization of the pelvic structures and often permits diagnosis as well as management of gynecological conditions. However, its disadvantages are that it is an invasive procedure and requires anesthesia, relatively expensive and requires expertise to carry out [6,7].

Laparoscopy at the university of Abuja teaching hospital, is done in the second half of the menstrual cycle (to enable visualization of stigmata of ovulation), under general endotracheal anesthesia. A Karl-Storz laparoscope is used and Carbon Dioxide used for artificial pneumoperitoneum.

Intra operative dye test is a procedure carried out at the time of myomectomy. Like laparoscopy, it allows direct visualization on adnexa structures. The benefit of an intra-operative dye test is that it eliminates the added cost of a separate laparoscopy and dye test for patients with uterine fibroids undergoing myomectomy but still retains all the advantages.

The diagnostic accuracy of HSG has been compared with that of

laparoscopy and dye test in a systematic review of 20 studies that distinguished between tubal obstruction and peritubal adhesions [9]. Meta-analysis based on these studies gave pooled estimates of sensitivity and specificity for HSG as a test for tubal obstruction of 0.65(95% CI 0.50 to 0.78) and 0.83(95% CI 0.77 to 0.88), respectively [9,10]. This means that when HSG suggests the presence of tubal obstruction this will be confirmed by laparoscopy in only 38% of women. Thus, HSG is a not a reliable indicator of tubal occlusion. However, when HSG suggests that the tubes are patent, this will be confirmed at laparoscopy in 94% of women, and so HSG is a reliable indicator of tubal patency [9,10].

Laparoscopy and dye test is usually performed for women with a hysterosalpingograph showing bilateral tubal blockage. However, in cases where she has uterine fibroids, an intra-operative dye test at the time of myomectomy is done to confirm the findings on the hysterosalpingograph. This prevents scheduling separate dates for the laparoscopy with dye test and the myomectomy procedure.

Results

During the period reviewed, Table 1 showed age distribution. Majority of the women in the study group were found within the age range of 30-34 years. With the age range of 35-36 years and 25-29 years ranking 2nd and 3rd respectively. 3 women were age above 40 years and none was seen below the age of 25 years.

Table 1. Age distribution of study group.

Age(years)	Number	%
25-29	11	15.3
30-34	45	62.5
35-39	13	18.1
>40	3	4.1
Total	72	100

Nulliparous women constituted more of the women in the study group with 77.8%, while multiparous women constituted 22.2% as seen in Table 2.

Table 2. Parity of study group.

Parity	Number	%
Nulliparous	56	77.8
Multiparous	16	22.2
Total	72	100

In Table 3, showed the pattern of finding of intraoperative dye test. The intra-operative dye test confirmed that the percentage of true positive for tubal occlusion following a HSG was 88.9%. The percentage of false positive (unilateral+bilateral patency) was 11.1%. This refers to the number of patent fallopian tubes not visualized on the HSG but were visualized following an intra-operative dye test.

Table 3. Pattern of findings at intra-operative dye test.

	Number	Percentage
Bilateral tubal occlusion	64	88.9
Unilateral patency	6	8.3
Bilateral patency	2	2.8
Total	72	100

Discussion

Uterine fibroids are a frequent finding and occur with increased frequency in older women prior to menopause. Uterine fibroid is a heterogeneous condition varying from a small single subserosal fibroid to multiple large lesions that radically distort pelvic anatomy [11]. Whereas the effect on fertility of the former is irrelevant, the latter strongly impairs the probability of conception. Available evidence suggests that submucosal, intramural and subserosal fibroids interfere with fertility in decreasing order of importance [11].

While uterine fibroids are a recognized cause of pregnancy loss, as a general rule, they are considered to be a rare cause of infertility. In certain

circumstances fibroids may contribute to infertility by causing tubal occlusion at the cornua, filling the uterine cavity or preventing successful nidation by impairing blood flow to the overlying endometrium where an embryo attempts to implant [12]. It is estimated that 5%-10% of infertile women have fibroids and that fibroids are present in 1%-2.4% of infertile women with no other obvious cause of infertility [11-13].

Two main pieces of clinical evidence support the opinion that the fibroids interfere with fertility.

First, in IVF cycles, the delivery rate is reduced in patients with fibroids but is not affected in patients who have undergone myomectomy [14].

Secondly, there are numerous reports that patients with unexplained infertility and myomas have increased fecundity after myomectomy [11,13,15]. Babaknia and colleagues evaluated 34 patients with primary infertility and 12 patients with secondary infertility [16]. After myomectomy, 38% of patients with primary infertility and 50% of those with secondary infertility had term pregnancies. Many other investigators have reported an approximately 50% pregnancy rate after myomectomy, with 75% of these occurring in the first year.

These findings have been confirmed by Rosenfeld, who evaluated 23 patients with unexplained infertility and myomas [17]. In this study, 65% of patients conceived after myomectomy, all but one within the first year. The age of the patient, duration of infertility, size and number of fibroids, hysterosalpingography, or presence of menorrhagia did not predict pregnancy outcome.

The preoperative infertility works up done for patients is vital as it is the best time to rule out other possible aetiologies of the infertility. This includes a thorough history and physical examination for both her and spouse as well as laboratory and imaging studies includes an ultrasound scan, hysterosalpingogram and/or a laparoscopy and dye test are pivotal in evaluating the uterine cavity and the patency of the fallopian tubes [1,2,18].

This study demonstrated that out of the 72 HSG done that reported bilateral tubal blockage only 64 were actually blocked with an accuracy of 88.9%. An intraoperative dye test was able to identify 8 tubes that had either unilateral or bilateral patency missed by the HSG. This is in keeping with findings that show HSG is not as accurate as a laparoscopy and dye test/intraoperative dye test in identifying blocked tube as 11.1% of fallopian tubes not visualized in the HSG were actually patent [7].

The study also demonstrated that the patient spent less on evaluation when an intra-operative dye test was done at the time of myomectomy instead of scheduling a separate laparoscopy and dye test. This has significant impute when considering the financial commitment of the patient in our resource poor setting.

Other significance of the intra-operative dye test also helps to make a diagnosis of unexplained infertility. This is defined as the absence of any identifiable cause of infertility following full evaluation. This is important in subsequent counselling sessions as the prognosis of spontaneous conception in women with unexplained infertility following myomectomy approaches 50% as some studies have shown [11,13,15,16].

Conclusion

While hysterosalpingogram and/or laparoscopy and dye test remain the standard for evaluating patients with possible tubal causes of their infertility, an intra-operative dye test can serve to reduce the financial burden of the patient without compromising a full clinical evaluation of such patients.

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