

# Contribution of tubal disease in the causation of primary infertility

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**Summary:** Tubal disease is an important cause of infertility, particularly in areas where pelvic inflammatory disease is common. In this study we evaluated 93 females with primary infertility for tubal disease. Seventy six females underwent Hysterosalpingography while 30 underwent laparoscopic examination of the pelvis. Thirteen females underwent both Hysterosalpingography and laparoscopy. Out of 93 females, 23(24.73%) were documented to have tubal disease. In 4 females with normal hysterosalpingographs, laparoscopy revealed disease. This study demonstrates that tubal disease significantly contributes to the causation of primary infertility in females in our patient population. We recommend that in women with ovulatory cycles, tubes should be evaluated rather early during infertility evaluation.

## Introduction

The result of various surveys indicate that infertility is a relatively common health problem. Infertility can be considered a public health problem given its medical, social, and demographic consequences (Thonneau et al, 1990). More and more couples are seeking help for the diagnosis of their infertility and, with recent advance in therapeutic technology, they have expectations of a satisfactory solution (Winfield et al, 1992). The causes of infertility are multiple with a spectrum ranging from clearly documented to controversial causes. In the United States, among the clearly documented causes, ovulatory failure has a prevalence of 16%, tubal damage 12%, semen factor 12%, and endometriosis 25% while among the controversial causes cervical factor and luteal phase deficiency have prevalences of 5% and 7% respectively while the exact prevalence of coital failure is not yet established (Jones et al, 1993).

Along with male factor, pelvic abnormalities (tubal occlu-

sions, adhesions, and endometriosis) account for the majority of cases of infertility; in most clinics 30-40% of the infertility can be attributed to the pelvic factor (Davajan et al, 1989). The diagnostic techniques for evaluating tubal function and the pelvis in general have become more sophisticated. However, all these tests primarily indicate tubal patency, obstruction or distortion and fail to indicate the degree of physiological impairment.

In this study, we determined the prevalence of tubal disease in women with primary infertility as demonstrated by a relatively simple radiologic technique - the hysterosalpingography - and a more sophisticated diagnostic technique - the laparoscopy.

## Material and Methods

We studied 93 females aged 18-40 years (mean  $\pm$  SD 31.48 $\pm$ 3.89) with primary infertility. Primary infertility was defined as failure to conceive after 1 year of unprotected sexual intercourse in a couple trying to achieve a preg-

nancy and in whom no previous conception had ever taken place (Davajan et al, 1989). A detailed history was taken in all subjects and a comprehensive clinical examination performed. Only those infertile females who were well estrogenised and had normal secondary sexual characteristics and normal menstrual cycles were included.

Detailed investigations were performed in all subjects including routine investigations like complete blood count, urinalysis, fasting and postprandial blood glucose, VDRL and X-ray chest; specific investigations performed included gonadotropin estimation. Hysterosalpingography was performed in 76 subjects. This radiologic study of the fallopian tubes involves transuterine dye instillation under radiologic visualization. The study was performed in the follicular phase of the menstrual cycle before ovulation. In patients with history of pelvic inflammatory disease (PID) the procedure was deferred till the white blood cell count and the erythrocyte sedimentation rate returned to normal. Antibiotic cover was given before and after the procedure. Laparoscopy was performed in 30 subjects in the follicular phase of the menstrual cycle. Statistical analysis was done by using Student's 't' test.

### Results

This study was conducted on 93 females with primary infertility. All of them were well estrogenised and had regular menstrual cycles. Seventy six subject underwent hysterosalpingography. Of the 76 hysterosalpingographs obtained, 18(23.68%) revealed tubal abnormalities which included bilateral tubal block in 12 and unilateral tubal block in 6 (Table 1 and Fig. 1). Of the 30 women who underwent laparoscopy 5 revealed bilateral tubal disease, 2 unilateral tubal block, 1 endometriosis, and 1 an adnexal mass. Out of these 93 females, 13 had both hysterosalpingography and laparoscopy performed. Out of these 13 females, 5 had hysterosalpingography as well as

laparoscopic findings normal, 4 who had abnormal hysterosalpingographs demonstrated tubal abnormalities on laparoscopy also, and 3 with normal hysterosalpingographs demonstrated tubal disease on laparoscopy. In all, out of the 93 subject studies 23(24.73%) had suggestion of tubal disease. Women with tubal disease had infertility of a significantly longer duration ( $p<0.05$ ).

**Table 1 :**  
**Showing the results of hysterosalpingography**  
**(n=76)**

Results	No. of patients	%
Normal	58	(76.31)
Bilateral tubal block	12	(15.79)
Unilateral tubal block	06	(7.89)
Total	76	(100.00)

**Table : 2**  
**Showing the characteristics of women with tubal diseases**

Parameters	Values (mean±SD)
1. Age (yr.)	31.48 ± 3.89
2. Duration of infertility (yr.)	7.64 ± 4.71
3. Age at menarche	14.1 ± 1.01
4. Body mass index	22.72 ± 3.09
5. LS level (IU/L)	7.46 ± 1.71*
6. FSH level (IU/L)	5.88 ± 1.45*

\*Mean ± SEM

### Discussion

Tubal disease significantly contributes to female infertility. A history of salpingitis is associated with high risk of infertility. Pelvic inflammatory disease due to various organism & is the main cause of tubal infertility. Follow-



up studies on fertility of women with laparoscopically documented PID have shown that for each episode of infection, there is at least a 10% risk of subsequent tubal infertility, irrespective of the type of micro-organism causing it; the effect seems to be additive, with the risk of tubal infertility doubling after a second episode of PID (Healy et al, 1994).

In our study 23(24.73%) of the 93 subject studies demonstrated evidence of tubal disease thereby indicating that tubal disease significantly contributes to infertility in our community. A study which reviewed the case records of 555 private patients complaining of primary infertility found that the aetiology of infertility was tubal in 131 (23.6%) (Jones et al, 1971). Two separate studies demonstrated that tubal factor was responsible for infertility in 18% and 16.3% cases respectively (Newton et al, 1974 and Dor et al, 1977). Our study demonstrated that even when hysterosalpingography is reported to be normal, laparoscopy may still demonstrate tubal abnormalities in some cases. In one study from Israel, 190 hysterosalpingographs were performed on infertile females; of these 74(38.94%) showed no abnormality, 23(12.11%) showed bilateral tubal occlusion, and 62(32.63%) showed a unilateral tubal occlusion or evidence of peritubal adhesions(Dor et al, 1977). A study of 291 infertile couples from Australia reported that tubal disease alone caused infertility in 6.5% while in another 4.5% it was one of the causes of infertility (Thomas et al, 1980). Some studies have reported a very high (41.2-60%) incidence of tubal disease (Giwa-Osagie et al 1984, and Kliger 1984).

Tubal infertility may follow PID, septic abortion, puerperal infection, suppurative appendicitis, peritonitis of other origins, or abdominal surgery. Infertility caused by some

of these conditions is partly preventable; uncomplicated appendectomy does not increase the risk of subsequent tubal block, whereas a ruptured appendix causes a 5-fold increase in such risk (Healy et al, 1994).

Hysterosalpingography is extremely valuable in the Workup of the infertile patient. In a population prone to PID, hysterosalpingograph should be obtained relatively early in the infertility investigation. The discovery of extensive tubal disease may alter and certainly speed up the other infertility studies. Laparoscopy has added a new dimension to the evaluation of tubal disease. The panoramic view of the pelvis provided by the laparoscope has made laparoscopy an integral part of the infertility investigation.

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