DISCUSSION
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In the present study, 100 cases were selected from the Gynaecological out patient department and admitted in the indoor of the Department of Obstetrics and Gynaecology, of Maharani Laxmi Bai Medical College, Jhansi. These patients were studied by diagnostic laparoscopy from April 1990 to March 1991.

The study group included the cases of infertility, chronic pelvic pain, suspected ectopic gestation, primary amenorrhoea and the miscellaneous group (Table I).

It was seen that 40% of the cases in whom diagnostic laparoscopy was carried out belonged to the infertility group, chronic pelvic pain contributed 20%, suspected ectopic gestation 15%, primary amenorrhoea 10% and miscellaneous group contributed 15% of all the cases.

Infertility:

40% cases belonged to the infertility group, thereby constituting major indication for diagnostic laparoscopy. It was similar to the observations of Duignan, N.M. et al (1972) who performed 67.5% diagnostic laparoscopies for investigating the infertility cases. Semchyshyn et al (1976)
also reported that infertility patients formed the foremost indication for diagnostic laparoscopy in their series. Similar observation has been reported by Prabhu et al (1988) and Chakraborti, Kole (1990). The incidence of infertility as an indication for diagnostic laparoscopy has been reported as the main indication in the studies of the above authors. The present study also supports the view.

Duigan, N.M. et al (1972) in his series of 1000 cases studied 520 patients of primary infertility and 155 cases of secondary infertility with a ratio of 3.4 : 1. Bose et al (1990) study had a ratio of 3.1 : 1 and study of Chakraborti, Kole (1990) had a ratio of 2.1 : 1. In our study a ratio of 3 : 1 was observed (Table II). Thus, as compared to secondary infertility, primary infertility constituted major group of study.

In the present study, the mean age of patients of primary infertility was 26.8 years and of secondary infertility was 28.5 years. In primary infertility group, maximum number of patients were in the age group 21 to 25 year and in the secondary infertility group, maximum number of patients were in the age group of 26 to 30 years (Table III)

This was parallel to the observation of Mc Kenna et al (1983) who found mean age of primary infertility 26 years, that of secondary infertility 30 years and an age range of 19 to 41 years.
Deshmukh, A.G. et al (1986) found maximum number of cases of infertility were in the age group of 20 to 24 years.

In the primary infertility group, maximum number of patients (46.67%) presented with less than 6 years of infertility and the minimum period of infertility in this group was 1 year, whereas in secondary infertility group, maximum number of patients (50%) presented with infertility of a duration of 6 to 10 years (Table IV). Couples were investigated after a minimum period of 1 year of infertile period.

Among the infertility cases, there were 12 patients in whom no abnormal findings of the pelvic organs could be found on laparoscopy. This gives an incidence of 30% in whom the pelvic organs were completely normal on diagnostic laparoscopy (Table V). This figure is comparable with that of Pent (1972) who found normal pelvic organs in 50% of infertility cases, Gupta, S. et al (1984) 30%, Chakraborti and Kole (1990) 21.4% and Bhise, A.G. (1990) who found it to be 27.80%.

70% of all the patients of infertility revealed abnormal pelvic findings on laparoscopy. Steptoe (1965) found evidence of pelvic pathology in 55 out of 74 patients of infertility, investigated by laparoscopy, giving an inci-
idence of 74.3%. This incidence was found to be 40.4% in Duignan et al (1972) series, 70% in study of Gupta, S. et al (1984), and 78.6% in study of Chakraborti and Kole (1990).

This large variation could be explained by the prevalence of subclinical pelvic infection, age group of patients, type of infection whether primary or secondary, socio-economic status of patients forming the study group.

The incidence of pelvic pathology as diagnosed by laparoscopy was higher in the secondary infertility cases as compared to the primary infertility, the incidence being 80% and 66.67% respectively. This is in accord with the reported incidence in secondary and primary infertility cases by Duignan et al (1972) who reported it to be 51% and 37.5%, Varma et al (1978) who reported 47.4% and 33.3%, and Prabhu et al (1988) who reported 100% and 57.2% respectively. This can be explained by the fact that the patients presenting with secondary infertility are more likely to have acquired infection either during puerperal or post abortal period.

Fallopian tube blockage was the most common abnormal finding observed in infertility cases in our study. In the present study of 40 cases of infertility, chromotubation was not done in 2 cases of primary infertility and in one case of secondary infertility, as they had genital
tuberculosis. Occlusion of one or both tubes was observed in 45% of all infertility cases. This included 12 cases of primary infertility (40%) and 6 cases of secondary infertility (60%).

This is in accord with the work of Maathius et al (1972) who found tubal block in 28% of their cases, Moghissi and Sim (1975) who found tubal occlusion in 48% of their cases, Varma et al (1978) who reported tubal occlusion in 38.2% of secondary infertility and in 24.5% of primary infertility cases with an overall incidence of 30.46%. Gupta, S. et al (1984) reported tubal block in 61.67% cases, and Bhide, A.G. (1990) reported it in 25.37% cases.

Out of 12 cases of primary infertility presenting with tubal block, 4 had adhesions too, while in secondary infertility cases, 5 out of 6 cases of tubal block were associated with adhesions.

Another significant finding was that bilateral block was more common as compared to unilateral block of the fallopian tubes in both primary and secondary infertility group. In the present study, out of 18 patients with tubal involvement, 22.22% had unilateral block, and 77.78% had bilateral block (Table VIII). Similar observations were made by Duignan, N.M. et al (1972) who found unilateral block in 42.7% and bilateral tubal block in 57.24% cases.
Deshmukh, A.G. et al (1986) found unilateral block in 15.38% (10 patients) and bilateral block in 84.62% cases (55 patients). Chakraborti and Kole (1990) reported (63 cases) 77.78% of bilateral block and (18 cases) 22.22% of unilateral block.

Diagnosis of tubal block was established with precision by laparoscopy. Many tubes which were diagnosed to be blocked by tubal insufflation and hysterosalpingography, have been found to be patent at laparoscopy. 37.84% of the cases on tubal insufflation revealed bilateral patent tubes, on hysterosalpingography, it was 43.24% and on laparoscopy the figure was 51.35%. In 13.51% unilateral block was found by tubal insufflation whereas it was 10.81% on HSG and laparoscopy. Bilateral tubal block was found in 48.65% cases by tubal insufflation, 45.95% by HSG and 37.84% by laparoscopy (Table IX). Of the 21 patients, who were found to have an abnormal HSG, laparoscopy disclosed a normal pelvis in 3 cases. Thus, 3 patients were found to have patent tubes on laparoscopy though diagnosed blocked on HSG. In one of these 3 cases HSG had revealed tuberculosis, whereas on laparoscopy both tubes were normal. HSG thus gave a false positive rate of 14.29%. The incidence of false positive results in the present study is parallel to the findings of Maathuis et al (1972), Sheth and Krishna (1979) and Bose et al (1990) who reported it to be 17%, 15%, 26.15% respectively.
No case with bilateral spill on HSG was found to be occluded at laparoscopy. 3 cases of peritubal adhesions with tubal patency were missed on HSG.

Pelvic adhesions were the second most common abnormality being present in 7 cases of primary infertility and 5 cases of secondary infertility, thereby constituting 23.33% and 50% respectively of the primary and secondary infertility cases, with an overall incidence of 30%. In the primary infertility group, tubal block accompanied adhesions in 4 cases. In the secondary infertility group, tubal block was present along with adhesions in all the 5 cases.


In our study, in both primary and secondary infertility cases, peritubal adhesions were the commonest of all the types of adhesions. In one of the cases of primary infertility, fimbrial adhesions was the laparoscopic finding.
This patient with fimbrial adhesions was subjected to laparotomy and fimbrial adhesions were broken down. This patient did conceive, but was a case of ectopic pregnancy.

Fibromyomata of the uterus was diagnosed in one case of infertility in the present study accounting for 2.5% of all infertility cases. Only in one case of primary infertility fibromyomata was diagnosed giving an incidence of 3.33% in primary infertility cases. This is comparable to the result of Duignan et al (1972) who found 3.0% incidence of fibromyomata in primary infertility cases. The incidence reported by Gupta, S. et al (1984) is 3.2% and by Prabhu et al (1988) 2.76%.

Endometriosis was found in one case of primary infertility. No endometriosis was seen in secondary infertility group. This gives an incidence of 3.33% of endometriosis in patients of primary infertility and an overall incidence of 2.5%.

This is comparable to the 5.1% incidence in primary infertility cases and 2.63% incidence in secondary infertility cases as reported by Varma et al (1978). Incidence of endometriosis was found to be 1.6% by Gupta, S. et al (1984); while 2.1% incidence in primary infertility group was observed by Prabhu et al (1988). Prabhu et al did not report endometriosis in secondary infertility cases. Study of Chakraborti and Kole (1990) revealed an incidence of 5.9%.
Cystic ovaries were observed in 3 cases of infertility accounting for 7.5% of all the cases of infertility. Out of this, 6.67% were found in primary infertility and 10% in secondary infertility. This was in accordance to the work of Gupta, S. et al (1984) who reported an incidence of 4.8% of all the infertility cases. Prabhu et al (1988) found 1.8% incidence in primary infertility cases and 7.3% in secondary infertility cases. Chakraborti and Kole (1990) found incidence of ovarian cyst to be 8.27%.

In the present study findings suggestive of genital tuberculosis were found in 3 cases of infertility giving an incidence of 7.5%. Out of this 2 cases were of primary infertility (6.67%) and one case of secondary infertility (10%). This is comparable to the results of Gupta, S. et al (1984) who reported an incidence of 11.6%, Deshmukh (1986) 3.9% and Chakraborti, Kole (1990) who reported it to be 8.30%. Endometrial biopsy had revealed tubercular endometritis in 2 of these 3 cases and in all these 3 cases chromatubation was not done to avoid flaring up of infection.

Hypoplastic uterus was found in 2.5% of all infertility cases in our study. One case of hypoplastic uterus was found in primary infertility group while, no case of hypoplastic uterus was found in secondary infertility group.
This is comparable to the results of Prabhu et al (1986) who found 1.1% incidence in primary infertility group and none in the secondary infertility group, and to the results of Bhide, A.G. (1990) who found 1.8% incidence of hypoplastic uterus in all the infertility cases.

**Chronic Pelvic Pain:**

Diagnostic laparoscopy was carried out in 20 cases with long standing abdominal pain not responding to treatment. Clinical examination in these cases did not reveal any pelvic pathology and X-ray of the lumbo-sacral joint had ruled out any orthopaedic problem.

35% of these patients had these symptoms for more than 5 years. 85% of patients were also above the age of 25 years and 20% of patients were nulliparous.

45% of the cases presented with no menstrual abnormality. 40% of the patients had dysmenorrhoea, while 10% cases had menorrhagia and 5% had scanty menstruation.

In the present study, 7 patients were found to have normal pelvic organs on laparoscopy. This gives an incidence of 35% of the cases with pelvic pain where cause for their complaints could not be found in the pelvis. The incidence of normal pelvic organs in cases of unexplained
pelvic pain is reported by Pent (1972) to be 42.86%, by Varma et al (1978) 61.4%, and by Cunanen, Courey Lippes (1983) to be 37%.

Pelvic adhesions were the major group of pathological findings in patients of chronic pelvic pain 20%. This is in parallel with the findings reported by Prabhu et al (1988) who reported 26.5% incidence.

Ovarian cyst was diagnosed in 10% cases.

Hydrosalpinx was seen in 10% cases of chronic pelvic pain. Prabhu et al (1988) found hydrosalpinx in 10.5% cases of unexplained pelvic pain. Evidence of pelvic tuberculosis was present in 10% cases. Prabhu et al (1988) found pelvic tuberculosis in 10.5% cases of unexplained pelvic pain.

Uterine fibromyoma was observed in 5% cases.

Simple pelvic congestion was observed in 5% cases.

Endometriosis was also observed in 5% cases. This is comparable to the results of Varma et al (1978) who found endometriosis in 4.39% cases of unexplained pelvic pain and to that of Pent (1972) who reported this incidence to be 7.14%.

Ectopic gestation:

In the present study, 15 cases of suspected ectopic pregnancy on clinical examination, were studied by laparoscopy. The diagnosis was proved correct in 10 cases.
60% of the patients were above the age of 25 years, 70% of them (7 patients) were nulliparous and out of these 5 patients had history of taking treatment for infertility. History of induced abortion was present in 20% cases. History of Amenorrhea was present in 70% cases. In 30% cases, there was evidence of internal haemorrhage clinically.

Laparoscopy confirmed the diagnosis of ectopic pregnancy in 10 cases. 50% of the cases were diagnosed before the rupture. 80% of the cases had ampullary and 20% had isthmic pregnancy. Jeffcoate also reports the commonest site to be ampullary followed by isthmic region.

All the 10 cases underwent laparotomy. Among the rest 5 cases, hydrosalpinx in 2 cases, acute salpingitis in 2 cases, and pelvic adhesions in one case were diagnosed on laparoscopy. Laparoscopy thus helped to avoid unnecessary laparotomy in 33.33% cases. This is in parallel to the work of Duignan et al (1972) who avoided unnecessary laparotomy in 66.7% cases, and Varma et al (1978) who avoided it in 64% cases.

The results of our study suggest that diagnostic laparoscopy plays an invaluable role in the diagnosis of suspected ectopic pregnancy.
Amenorrhoea:

10 patients with a diagnosis of primary amenorrhoea were included in the present series.

Out of all the patients presenting with primary amenorrhoea 80% were in between 18 to 20 years of age. 20% had poorly developed secondary sex characters. In 40% cases the vagina was canalized.

In 50% it was partially canalized, while in 10% it was non canalized. Thus 60% cases of primary amenorrhoea presented with absent or partially canalized vagina. Mullerian agenesis was present in 50% cases. Out of these in 20% cases ovarian tissue was seen. Small nodular uterus with tubes and normal ovarian tissue was present in 10% cases.

Patients who presented with canalized vagina (40%), had normal looking pelvic organs in 20% cases, hypoplastic uterus with well developed tubes and ovaries in 10% cases and bilateral polycystic ovaries in 10% cases.

Thus, laparoscopy, helped to establish a diagnosis in the cases of primary amenorrhoea. Steptoe (1965) could establish a diagnosis in all the 4 cases of primary amenorrhoea by laparoscopy. Diagnosis in cases of primary amenorrhoea by laparoscopy has been achieved by various workers, Duignan et al (1972), Semchyshyn et al (1976), Varma et al (1978), Gupta, B. et al (1986).
In our study, incomplete development of Mullerian tract was the main pathology detected. This is in parallel with the findings of Gupta, B. et al (1986), Sholapurkar, M.L. (1986), Sud et al (1987), Prabhu et al (1988).

Miscellaneous:

15 patients were studied in this group (Table 17). Two patients were thought to have a double uterus on clinical examination. Laparoscopy revealed a double uterus with one adenexae on each side in one case, while in the other case arcuate uterus was diagnosed. One case had displaced Cu-T. Laparoscopy revealed it to be embedded in the left broad ligament.

Three cases were considered for laparoscopy in order to evaluate tubal condition prior to recanalization. Out of this in one case tuboplasty was abandoned due to the presence of bilateral tubo ovarian masses. Thus laparoscopy helped to avoid unnecessary laparotomy in 33.33% of the patients considered for tuboplasty. In rest 2 case (66.67%) tuboplasty was done.

Pelvic mass was diagnosed in the 9 cases, but the exact nature of pelvic mass was not definite in these cases.

Diagnosis made on clinical examination was tubo ovarian masses in 3 cases, ovarian cyst in 4 cases, hydrosalphinx in 1 case and fibroid uterus in 1 case. Out of these
cases of pelvic mass, in 44.44% cases (4 patients) laparoscopy confirmed the clinical diagnosis was correct. Chakraborti, Kole (1990) confirmed the clinical diagnosis on laparoscopy in 15 out of 24 patients studied for obscure pelvic mass giving an incidence of 62.5%. Thus, laparoscopy provides the gynaecologists with a diagnostic potential when the clinical methods fail or are in doubt.

Out of 9 cases of pelvic mass, laparoscopy revealed 5 had ovarian cyst giving an incidence of 55.56%. Next common finding was tubo-ovarian masses seen in 22.22% cases. Fibroid uterus was seen in 1 case (11.11%) and hydro-salpinx was seen in 1 case (11.11%). This finding is in parallel with the work of Sud et al (1987) who revealed ovarian cyst in 50%, tubo-ovarian mass in 25% and myoma in 18.75% cases. Prabhu et al (1988) revealed ovarian cyst in 66.67%, tubo-ovarian masses in 26.7% and uterine fibroid in one patient.

Thus, laparoscopy provides the gynaecologists a major diagnostic tool.