Endoscopic evaluation of infertile women

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ABSTRACT

Background: The World Health Organization (WHO) estimates that 60 to 80 million couples worldwide currently suffer from infertility. Infertility varies across regions of the world and is estimated to affect 8 to 12 per cent of couples worldwide. The WHO estimates the overall prevalence of primary infertility in India to be between 3.9 and 16.8 per cent.

Aims and Objectives: To analyse the laparoscopic and hysteroscopic findings in infertile women and evaluate the causes of infertility by endoscopy.

Material and Methods: A total of 50 patients of infertility, both primary and secondary infertility admitted in PGIMS, Rohtak over a period of one year were included. Patients with infertility due to male factors, hormonal disorders, sexual disorders and patients with absolute and relative contraindication for laparoscopy were excluded from the present study.

Results: Mean age of study population was 27.52±4.06 years. Mean duration of infertility in the study population was 4.95±3.36 years. Dysmenorrhoea (56%) was the most common symptom among the two groups. Both hysteroscopy and laparoscopy showed normal findings in 20% and 16% patients of primary and secondary infertility respective. Maximum number of patients 41(82%) i.e. 20(80%) in primary and 21(84%) in secondary group had pelvic pathology on hysterolaparoscopic examination. Laparoscopy showed pathology in 76% and 80% patients of primary and secondary infertility, respectively. Hysteroscopy showed abnormalities in 20% and 24% patients of primary and secondary infertility, respectively.

Conclusion: Diagnostic hysterolaparoscopy is an effective and safe tool in comprehensive evaluation of infertility, particularly for detecting endometriosis, peritoneal and adnexal adhesions and pelvic inflammatory disease.
INTRODUCTION
The World Health Organization (WHO) estimates that 60 to 80 million couples worldwide currently suffer from infertility.\(^1\) Infertility varies across regions of the world and is estimated to affect 8 to 12 per cent of couples worldwide.\(^2,3\) Underlying these numbers exists a core group of couples, estimated to be 3 to 5 per cent, who are infertile due to unknown or unpreventable conditions. The WHO estimates the overall prevalence of primary infertility in India to be between 3.9 and 16.8 per cent.\(^1\) Estimates of infertility vary widely among Indian states from 3.7 per cent in Uttar Pradesh, Himachal Pradesh and Maharashtra,\(^7\) to 5 per cent in Andhra Pradesh,\(^8\) and 15 per cent in Kashmir.\(^9\) Moreover, the prevalence of primary infertility has also been shown to vary across tribes and castes within the same region in India.\(^10\) Total infertility is divided into primary and secondary infertility.

Infertility is a complex disorder with significant medical, psychosocial, and economic problems. The number of couples seeking medical help for infertility is increasing dramatically (from 8% to 10-15%).\(^13,14\) Infertility affects men and woman alike, as both genders report associated psychological distress, depression and low self-esteem.\(^18,19\) In 20-30 per cent of cases the problem rests with the male, in 20-35 per cent with the female, 2045 per cent with both partners, and in a further 10-20 percent of cases, the cause is unknown.

Laparoscopy has emerged in recent years as an accurate method of assessing, evaluating and treating infertility.\(^21-23\) The Advances in endoscopic surgery have revolutionized the approaches of gynaecologists for diagnosis and management of patients with infertility. Laparoscopy is the standard means of diagnosing the tubal pathology, peritoneal factors and endometriosis and intraabdominal causes of infertility. Not only does this help in identification of unsuspected pelvic pathology but also contributes to decision making of infertility treatment.

Normally in an infertility clinic, clinical findings, serum markers, endometrial sampling is being utilised for detection of tuberculosis and PID but usually the diagnosis cannot be established with these modalities. A few studies have been found in literature which utilise hysterolaparoscopy in evaluation of infertility. In our set up we also tried to utilise hysterolaparoscopy as a single effective modality in evaluation.

MATERIAL AND METHODS
This prospective study was carried out on the patients of infertility who were admitted in the Department of Gynaecology and Obstetrics at Pt. B.D. Sharma Postgraduate Institute of Medical Sciences, Rohtak. A total of 50 patients of infertility, both primary and secondary admitted in the department over a period of one year were included in the study. Patients with infertility due to male factors, hormonal disorders, sexual disorders and patients with absolute and relative contraindication for laparoscopy were excluded from the present study. All the patients were fully explained about the procedure and its complications. Written explicit consent was taken in patient's own language. In the outpatient department (OPD), the infertile couple were evaluated by detailed
clinical examination and the following tests were performed: Haemoglobin, Bleeding time, Clotting time, Random blood sugar, Erythrocyte sedimentation rate, HIV, HbsAg, VDRL, Thyroid profile (T₃, T₄, TSH), Complete Urine examination and culture, Montoux test, Husband Semen analysis, Hysterosalpingography, Ultrasound (uterus and bilateral adnexa, pelvis), ECG and Chest x-ray. Endometrial biopsy was taken on the first day of menstrual cycle for histopathology and AFB.

Hysterolaparoscopy was carried out in the follicular phase of the menstrual cycle on inpatient basis under general anaesthesia, as one step procedure. Hysteroscopy was performed and the cervical canal, uterine cavity (anterior, posterior, lateral walls and fundus), and both ostia were thoroughly inspected for: Congenital malformations, intrauterine adhesions, atrophic endometrium, calcification, fibroids, polyps and fibrosed ostia. Laparoscopy was performed and thorough inspection of uterus, anterior and posterior cul-de-sacs, fallopian tubes, ovaries and rest of the pelvic peritoneum and liver surface was done. All the cases underwent chromopertubation using methylene blue dye. Any abnormal findings were noted down. Targeted biopsies were performed for histologic corroboration, comparing the endoscopic findings and diagnosis to the histopathology results. Therapeutic interventions were done, if required.

**Statistical analysis**

At the end of the study, the data was collected and analysed statistically by using Student t-test (unpaired) and Chi-square test. A p value of <0.05 was considered as significant. The results were analysed by using SPSS software v. 17.0.

**RESULTS**

In the present study equal number of patients i.e. 25(50%) patients each of primary and secondary infertility were studied. Mean age of our study population was 27.52±4.06 years with a range of 20-37 years. Maximum number of women belonged to rural background i.e. a total of 64% and 36% were from urban areas. In primary infertility group, mean duration of infertility was 5.66±3.78 years and in secondary infertility group it was 4.24±2.77 years. Mean duration of infertility in total study population was 4.95±3.36 years (>0.05 Not significant). Dysmenorrhoea(56%) was the most common symptom among two groups. In primary infertility a total of 17(68%) women had dysmenorrhoea and secondary infertility it was in 11 (44%) women. The other common symptoms were dyspareunia 12(24%) followed by chronic pelvic pain 7(14%) (p >0.05). A total of 5(20%) patients of primary and 4(16%) patients of secondary infertile group had no pelvic abnormality. Maximum number of patients 41(82%) i.e. 20(80%) in primary and 21(84%) in secondary group had pelvic pathology on hysterolaparoscopic examination. On statistical analysis, abnormal findings were significantly more compared to normal findings in both the groups.

A total of 8(32%) patients of primary and 10(40%) patients of secondary infertile group had single pelvic abnormality. Majority of patients i.e. 12(48%) in primary and 11(44%) in secondary group had multiple pelvic abnormalities. On statistical analysis, the difference was found to be comparable in both the groups and statistically insignificant.
Both hysteroscopy and laparoscopy showed normal findings in 20% and 16%, abnormal findings in 16% and 20% women in primary and secondary group respectively.

### Table I

<table>
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<tr>
<th>Findings</th>
<th>Primary infertility (n=25)</th>
<th>Secondary infertility (n=25)</th>
<th>Total (n=50)</th>
<th>Statistical significance</th>
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*Bilateral tubal block was present in 5 and 4 cases, unilateral block was present in 2 and 8 cases of primary and secondary infertility, respectively. Tubal rigidity was seen in 1 case of primary infertility, tubal beading was present in 5 cases of each group, hydrosalpinx/pyosalpinx was present in two cases of secondary infertility, tuboovarian mass was seen in 2 cases of primary infertility. Similarly endometriosis was present in 4 and 2 cases of primary and secondary infertility group. Pelvic adhesions was present in 11 and 6 cases, ovarian cyst in 2 and 1 case, functional cysts in 2 and 3 cases.*

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References

International J. of Healthcare and Biomedical Research, Volume: 05, Issue: 03, April 2017, 36-48
cyst in 2 and 0 case, dermoid cyst in 0 and 1 case of primary and secondary infertility, respectively. PCOS in 2 cases of each group, respectively and myoma was present in 2 and 4 cases of primary and secondary infertility group (p >0.05). Bilateral spill was seen in 18 cases of primary and 16 cases of secondary infertility. Bilateral spill was absent in 5 and 4 cases, unilateral spill was present in 2 and 5 cases (p >0.05). All the patients who had endometriosis were categorised into various endometriosis grading and amongst the patients of primary infertility, one patient had grade I, 2 had grade III and 1 had grade IV endometriosis, but in secondary group 1 patient each of grade III and IV endometriosis were noted. Endometrioma was present in 2 cases each of primary and secondary infertility group (p >0.05).

Out of 11 patients of primary infertility who had adnexal adhesions, 5 patients had minimal adhesions, 3 mild, 2 moderate and 1 severe whereas in secondary infertility, total six patients had adhesions out of which 1 each with mild, moderate and severe and 3 patients had minimal adhesions. A total of 16% patients of infertility had minimal adhesions, 8% had mild, 6% had moderate and 4% had severe.

Table II
Hysteroscopic findings

<table>
<thead>
<tr>
<th></th>
<th>Primary infertility (n=25)</th>
<th>Secondary infertility (n=25)</th>
<th>Total (n=50)</th>
<th>Statistical analysis</th>
</tr>
</thead>
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<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
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<td>Normal uterus cavity</td>
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<td>80</td>
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<td>20</td>
<td>6</td>
<td>24</td>
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<td>Congenital Bicornuate Septae</td>
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<td>0</td>
<td>2</td>
<td>8</td>
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<tr>
<td>Adhesions</td>
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<td>4</td>
<td>1</td>
<td>4</td>
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<td>Atrophic endometrium</td>
<td>1</td>
<td>4</td>
<td>1</td>
<td>4</td>
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<tr>
<td>Calcification</td>
<td>1</td>
<td>4</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Fibroid/myoma</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>4</td>
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<tr>
<td>Fibrosed ostia</td>
<td>2</td>
<td>8</td>
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</tr>
</tbody>
</table>

Chi-square (χ2) test
Table II shows various hysteroscopic findings observed in both the groups. In primary infertility group, normal uterine cavity was present in 20 cases; abnormal findings were seen in 5, congenital abnormality was not present in any case, atrophic endometrium in 1, calcification in 1, fibroid / myoma in 0 case, polyp in 2 cases and fibrosed ostia was seen in 2 cases. Similarly, in secondary infertility group, normal uterine cavity was present in 19 cases; abnormal findings in 6, congenital abnormalities in 2 cases, adhesions in 1 case, atrophic endometrium in 1, calcification in 0, fibroid / myoma in 1 case, polyp in 1 case and fibrosed ostia also in 1 case.

Peroperative biopsy was taken in patients and it revealed non-specific inflammatory changes in 8 patients, histology was suggestive of endometriosis in 4, on biopsy of various cysts 2 had functional cyst and 1 had dermoid cyst. Granulomatous inflammation suggestive of tuberculosis was seen in 3 patients.

In the present study, majority of patients underwent adhesinolysis i.e. 17 cases, in patients of PCOS ovarian drilling was done. Seven patients underwent cystectomy. Surgery of endometriosis was done for 6 cases. Laparotomy followed by myomectomy was done in 3 cases. All the patients underwent chromopertubation. A total of 56% patients of primary infertility had no complications and 64% patients of secondary infertility had no complications. Most common complaint after surgery was abdominal pain whereas fever was reported in only 3 patients and shoulder tip pain and surgical emphysema was seen in 1 patient each.

DISCUSSION

Laparoscopy and hysteroscopy play an important role as both diagnostic and therapeutic tools in the infertility treatment centers. The percentage of abnormalities found during laparoscopy and hysteroscopy, and difficulty to visualize by the use of other non-invasive methods, increases the clinical value of these procedures and justifies their application.

Mean age of our study population was 27.52±4.06 years. In primary infertility group, mean age was 26.56±4.18 years and in secondary infertility group it was 28.48±3.77 years (>0.05 Not significant). This was similar to the mean age of infertile women in study conducted by Clever et al\textsuperscript{80} where mean age reported was 27.37±4.50 years. Similar age distribution was seen in study by Nayak et al\textsuperscript{72} (primary infertility 28.8±3.7 years and secondary infertility 31.1±4.5 years. But this value is lower than that of Bonneau et al\textsuperscript{70} in France where the mean age of their study was 32.2±4.54 years. The difference may be due to cultural differences influencing the age at marriage.

In primary infertility group, mean duration of infertility was 5.66±3.78 years and in secondary infertility group it was 4.24±2.77 years. Mean duration of total study population was 4.95±3.36 years (>0.05 Not significant). This was almost comparable to study conducted by Boudhraa et al\textsuperscript{65} in which mean duration of infertility in primary infertility and secondary infertility patients was 5.42 and 4.61 years respectively. The mean duration of infertility is reported low in another study conducted by de Medeiros et al\textsuperscript{69} where the average length of infertility was 2 years (95%
CI: 1.53) for primary infertility and 3 years (95% CI: 2.0-13.0) for secondary infertility. The presence of enormous local traditional healing practices and religious believes could be an important contributory factor for the delay in presentation to health facilities and the fact that majority of the population in our study group belonged to rural area and has low literacy level, thus reflecting poor treatment seeking behaviour.

In the present study equal number of patients i.e. 25(50%) patients had primary and secondary infertility, which is similar to study conducted by Zhang et al\textsuperscript{31} where out of 132 patients, 71 (53.8%) women had primary infertility and the rest 61 (46.2%) women had secondary infertility. Similar distribution of primary (48%) and secondary infertility (52%) was seen by Puri et al\textsuperscript{32} whereas Bonneau et al\textsuperscript{27} reported 73.7% patients of primary infertility and 23.6% patients of secondary infertility. The higher rate of secondary infertility in our study compared to western studies suggest possible effects of pelvic inflammatory disease, post abortal sepsis and puerperal sepsis in our setting. Major symptoms in our study were dysmenorrhea, dyspareunia and irregular cycles, which are in accordance with other infertility studies reported by Aziz et al\textsuperscript{33} and Wani et al.\textsuperscript{29}

A total of 5(20%) patients of primary and 4(16%) patients of secondary infertile group had no pelvic abnormality. Maximum number of patients i.e. 20(80%) in primary and 21(84%) in secondary group had pelvic abnormalities on hysterolaparoscopic examination. Similar results were reported by Bonneau et al\textsuperscript{27}, Aziz et al\textsuperscript{33} and Tsuji et al\textsuperscript{35} where pelvic pathology was seen in 83.4%, 80% and 80.7% respectively. Jayakrishnan et al\textsuperscript{36} and Wani et al\textsuperscript{29} also observed abnormal pelvic findings in 82.7% and 80% respectively. Whereas in study conducted by Godinzak et al\textsuperscript{37} and Kabadi et al\textsuperscript{38} pelvic pathology was reported in 53.86% and 51.7% patients.

A total of 8(32%) patients of primary and 10(40%) patients of secondary infertile group were found to have single pelvic pathology. Majority of patients i.e. 12(48%) in primary and 11(44%) in secondary group had multiple pelvic pathologies. On statistical analysis, the difference was found to be comparable in both the groups and statistically insignificant (p >0.05). This was in contrast to study done by al Wazzan et al\textsuperscript{39} where single pelvic abnormality was detected during laparoscopy among infertility patients in 75.09%, n=808 of cases and it was statistically different (p value 0.000) from multiple pelvic abnormality 24.91%, n=268 and it was the highly significant among primary infertility patients (77.24%, n=611) and among secondary infertility (30.87%, n=88). This can be explained by design of study done by al Wazzan\textsuperscript{39} where only laparoscopy was done instead of both hysterolaparoscopy. Multiple pathologies have also been observed by Bonneau et al\textsuperscript{27}, Vadi et al\textsuperscript{40} and de Mederois et al.\textsuperscript{30}

In our study laparoscopy showed pathology in 39(78%) of patients. Hysteroscopy identified abnormalities in 11(22%) patients. The results were comparable in both groups and so were statistically insignificant. Similary Godinzak et al\textsuperscript{37}, Zhang et al\textsuperscript{31}, Kabadi et al\textsuperscript{38} also found that abnormalities detected by laparoscopy were more common than those by hysteroscopy.
Pelvic adhesions were the most common laparoscopic finding 17(34%), in primary infertility group adhesions were present in 44% and in secondary infertility group it was present in 24%. Similarly pelvic adhesion were the most common laparoscopic anomaly observed by Bonneau et al\textsuperscript{27} 48.9% and Vaid et al\textsuperscript{40} 33.67%. Bonneau et al\textsuperscript{27} reported adhesions as slight in 50%, moderate in 28.3% and severe in 21.7% using operative laparoscopy study group classification. As there is no uniform and universal system of classification of adhesions and different studies use different classification, so comparison with other studies becomes difficult. Adhesinolysis was performed within reasonable limits.

Pelvic adhesions were followed by tubal blockage as the second most common pelvic abnormality. Bilateral free peritoneal spill was seen in 34 (68%) patients, which are similar to the results seen in study conducted by Kaminski et al\textsuperscript{41} who observed bilateral free spill in 62.05% patients and de mederios et al\textsuperscript{30} where 62.4% patients had bilateral free spill on chromopertubation. Bilateral tubal blockage (18%) was more common than unilateral blockage (14%). Clever et al\textsuperscript{25} reported bilateral tubal blockage in 21.74% patients, Similarly Vaid et al\textsuperscript{40} observed bilateral tubal blockage in 16.06% patients. Unilateral tubal blockage was seen in 14% patients, which is similar to the studies conducted by Jayakrishnan et al\textsuperscript{36}, 13.4% and Vaid et al\textsuperscript{40} 13.47%. However the results are in contrast to the Godinjak et al\textsuperscript{37} who observed bilateral blockage in 5% and unilateral tubal blockage in 8.33%. This is because patients in the study conducted by Godinjak et al\textsuperscript{37} were tested for chlamydia antibodies. This high incidence of tuboperitoneal related pathologies may be due to pelvic inflammatory disease which is amongst the most common gynaecological disease, non-compliance to pelvic inflammatory disease treatment, which may lead to sub-acute or chronic pelvic inflammatory disease with deleterious effects on the fallopian tubes, may also be a contributory factor.

In our study tubal beading and sacculations were seen in 10% patients on laparoscopy, which is comparable to de mederios\textsuperscript{30} who found 10.1% patients to have tubal beading, Puri et al\textsuperscript{32} and Vaid et al\textsuperscript{40} observed 6% and 4.4% patients with tubal beading respectively. In our study hydro/pyosalpinx was observed in 4% patients, this is comparable to Kaminski et al\textsuperscript{41} who observed hydro/pyosalpinx in 5.1% patients. Similarly study conducted by Vaid et al\textsuperscript{40} and Puri et al\textsuperscript{32} observed hydrosalpinx in 2.59 and 6% respectively.

In the present study tubo-ovarian mass was seen in 4% patients, only 2 patients (8%) of primary infertility had tubo-ovarian mass whereas none was seen in secondary infertility. Similarly Vaid et al\textsuperscript{40} observed that 3.62% patients in his study had tuboovarian mass and Puri et al\textsuperscript{32} reported one (2%) patient with tuboovarian mass in their study.

Genital tuberculosis not only causes tubal obstruction and dysfunction but also impairs implantation due to endometrial involvement and ovulatory failure from ovarian involvement. Our study could reveal genital tract tuberculosis in 3 patients (6%), 2 patients and 1 patient of primary and secondary infertility respectively. There is a significant
pelvic morbidity and tubal damage in genital tuberculosis.

Similar findings were observed by Sharma et al. Wani et al. reported genital tuberculosis in 6.1% and 5.5% cases of primary and secondary infertility respectively.

In the present study endometriosis was seen in 6 (12%) patients, 16% patients of primary infertility had endometriosis and 8% of secondary infertility patient had endometriosis. The findings in our study are comparable to that observed by Godinjak et al. and Kaminski et al. 12.4%.

Similar results were seen in Indian studies conducted by Kabadi et al. and Nayak et al. who observed that 12% and 12% patients respectively had endometriosis. Endometrioma was seen in 4 (8%) of the patients. Similar results were reported by Kabadi et al. who observed chocolate cyst in 6.66% of patients. However the result was low compared to another study conducted by Bonneau et al. who reported endometriosis in 75.8% patients. This discrepancy is due to the difference in racial and environmental factor as well as to the practice of avoiding sexual intercourse at time of menstruation. Out of the 6 patients, 4 (66.66%) patients had endometriosis on histopathological examination. Endometriosis was treated with electro ablation, resection of endometriotic implants and/or ovarian cystectomy.

In the present study ovarian cyst was seen in 3 patients (6%), cystectomy was done in these patients and on histopathology they were diagnosed to be functional cyst in 2 patients (4%) and dermoid cyst in 1 (2%) patients. Similar result was observed by Godinjak et al., who reported functional cyst in 4.44% patients and dermoid cyst in 2.22% patients, similar results were observed by al Wazzan et al. who reported ovarian cyst and tumors in 3.5% patients. Vaid et al. reported ovarian cyst in 1.03% patients. Zhang et al. reported dermoid cyst in 4.55% cases, where as Kaminski et al. reported ovarian cysts in 15.1% patients of primary infertility and in 15.7% of secondary infertility, out of which simple cyst was seen in 6% of the total cases. This difference may be due to large sample size in their study.

In the present study the incidence of polycystic ovarian disease was found to be 8% which is quite similar to that observed by Zhang et al. and Vaid et al. who reported polycystic ovaries in 5.3% and in 5.18% patients respectively. However, polycystic ovaries was reported in 19.3% patients by Kaminski et al. and in 14.28% by Kabadi et al. As polycystic ovaries is a highly complex and heterogeneous disorder with significant contributions of both genetic and environmental factors thereby explaining the difference in observations between different studies. Ovarian drilling was done in these patients.

Our study revealed myomas 6 (12%) patients, laparoscopy detected myoma in all 6 cases but 1 patient of fibroid was seen by both hysteroscopy and laparoscopy. Kaminski et al. reported myomas in 10.8% patients by laparoscopy and similar findings were reported by Tsuji et al., where myoma was seen in 10.5% patients, however Zhang et al. and Nayak et al. reported myomas in 15.5% and 5% patients. Myomectomy was done in 3 patients who had intramural fibroid and on
histopathology the diagnosis of leiomyoma was confirmed.

In the present study hysteroscopy revealed abnormalities in 22% patients, in 9 patients (18%) both laparoscopy and hysteroscopy revealed abnormality, while hysteroscopy provided added advantage in only 2(4%) patients. Uterine cavity was normal in 78% patients, this is comparable to study conducted by Godinjak et al\textsuperscript{37} who reported normal findings in 80% who underwent hysteroscopy, similarly normal uterine cavity was seen in 71.6% patients by Kabadi et al.\textsuperscript{38} In our study uterine anomaly was seen in 2 (4%) patients, bicornuate uterus was seen in 1 (2%) patient and septate uterus was seen in 1(2%) patients. Godinjak et al\textsuperscript{37} observed uterine anomaly in 5.27% patients, in which uterine septa were seen in 1.9% and bicornuate uterus was seen in 1.3%. Clever et al\textsuperscript{25} reported bicornuate uterus in 1.8% cases. In the present study, polyps were reported in 3(6%) patients, with 2(8%) patients of primary infertility having polyps compared to secondary infertility were polyps were seen in 4% cases. The results are comparable to Nayak et al\textsuperscript{26} 5% and Godinjak et al\textsuperscript{37} polyps i.e. 7.22%. The diagnosis of polyp was confirmed on histopathology.

Intrauterine adhesions were seen in 2 patients (4%), one each in primary and secondary infertility group, similar results were seen by Zhang et al\textsuperscript{31} who reported synechiae in 3.79% patients whereas Vaid et al\textsuperscript{40} reported synechiae in <1% patients and Kabadi et al\textsuperscript{38} reported it in 8.3% cases. Atrophic endometrium was seen on hysteroscopy in 2(4%), and calcification in 2%. Similar results were reported by Vaid et al\textsuperscript{40} who reported calcified irregular endometrium in 3.6% cases. Other than nausea / vomiting and mild abdominal pain, there was no major surgical or anaesthetic complication in any of our patients. Similarly, no major postoperative complications were reported by other authors.\textsuperscript{26,29}

Although, endoscopic evaluation requires highly sophisticated apparatus but many patients can be evaluated using same instrument, thus in long term endoscopy proves to be a cost effective modality.

**CONCLUSION**

Diagnostic hysterosalpingography is an effective and safe tool in comprehensive evaluation of infertility, particularly for detecting endometriosis, peritoneal and adnexal adhesions and pelvic inflammatory disease. These are correctable abnormalities that are unfortunately missed by routine pelvic examination and usual imaging procedures. When done by experienced hands and with proper selection of patients, hysterosalpingography can be considered as a definitive investigative procedure for evaluation of female infertility.
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Among infertile women undergoing laparoscopy, dysmenorrhea was the only symptom significantly predictive of endometriosis (Forman, et al., 1993). However, no differences in the rates of pelvic pain, dyspareunia or vaginal discharge were seen among women with endometriosis, compared to those with normal pelvis or adhesions (Forman, et al., 1993). A Gynaecological endoscopic evaluation of 4% icodextrin solution: a European, multicentre, double-blind, randomized study of the efficacy and safety in the reduction of de novo adhesions after laparoscopic gynaecological surgery. Hum Reprod 2011; 26:2015-2027.

2.5 Preoperative hormonal therapies for treatment of endometriosis-associated pain. The technique was first used on women undergoing TOP. It was used to exclude external malformations in ongoing pregnancies. Human data are still limited but infants born after first trimester embryoscopy did not demonstrate any visual impairment. The exact risk of abortion following the procedure is unknown. Recently, transcervical embryoscopy has been revived in the evaluation of missed abortion prior to 12 weeks, in particular in recurrent miscarriages or fertility treatment programmes. In the latter, those pregnancies that have a higher risk to fail, might be biochemically identified very early in their course, and as such, could be assessed electively. Full video-endoscopic hardware is needed, such as a high quality light source.