



Original Paper

Role of Hysterolaparoscopy in the Management of Infertility

Authors

Prof. (Dr) Rabindra Nath Behera¹, Dr Sini Venugopal^{2*}, Dr Pruthiraj Behera³

¹Dept. of Obstetrics & Gynaecology, Hi-Tech Medical College & Hospital, Bhubaneswar 751010, Odisha

²Assistant Professor, Department of Obstetrics and Gynecology, Hi-Tech Medical College & Hospital, Bhubaneswar, Odisha, India

³Final Year PG, Department of Obstetrics and Gynecology, Hi-Tech Medical College & Hospital, Bhubaneswar, Odisha, India

*Corresponding Author

Dr Sini Venugopal

Assistant Professor, Department of Obstetrics and Gynecology, Hi-Tech Medical College & Hospital, Bhubaneswar, Odisha, India

Abstract

Objective: *This is a Prospective analytical study carried out in department of Obstetrics and Gynecology, Hi-Tech Medical College & Hospital, Bhubaneswar, a tertiary care centre, to find out the role of combined laparoscopy and simultaneous hysteroscopy in the management of infertility.*

Materials and Method: *A total of 70 women who reported with complaint of infertility were chosen for study. The women were evaluated for female factor by laparoscopy and simultaneous hysteroscopy. Tubal patency study was also done. The study was conducted over a two year period i.e. from November 2018 to October 2020 at Hi-Tech Medical College & Hospital, Bhubaneswar.*

Results: *Age of the women ranged from 21 to 40 years and the mean age was 27.97 years. In hysteroscopy, endometrial polyp, cervical stenosis, submucous fibroid, ostial block and septate uterus was identified. In laparoscopy, various pathologies like polycystic ovarian disease, endometriosis, bilateral and unilateral tubal block, pelvic adhesions, myomas and uterine anomalies were detected.*

Conclusion: *In investigating the causes of female infertility, a combined laparoscopy with simultaneous hysteroscopy provides the best approach to diagnose the pathologies.*

Keywords: *Laparoscopy, Hysteroscopy, Infertility.*

Introduction

Infertility is now a cause of global concern. The negative impacts of population explosion on one hand and the serious concerns of increasing infertility problems among couples on the other hand seems like a malady of contradictions. Infertility has been recognised as a serious issue and a genuine reproductive health problem

globally. Fertility and infertility are socially seen as matters of pride and prejudice respectively. Infertility affects the self-esteem of the individual, it affects the entire family, reduces the social status of the affected individual and the family, disrupts the basic fabric of the standard norms of a family set by society and most important of all, it forbid the couple the joy of nurturing their biological

offspring. Negative psychosocial consequences of childlessness are common often severe.

Pelvic abnormality in the infertile women is frequently not appreciated by pelvic examination and the usual diagnostic studies. For this reason, direct endoscopic technique has been advanced as a routine component of the complete evaluation of the infertile women.

Hysteroscopy provides a means of direct observation of intra uterine defects, which can eventually interfere with fertility and also serves as a means for therapy for intra-uterine lesions, for which hysteroscopy is the method of choice.¹ Laparoscopy often brings to light unexpected pelvic pathology. Often early and subtle cases of infertility is thus revealed and treated which leads to rewarding results. Hysterolaparoscopy thus provides a comprehensive investigative procedure in which various factors leading to female infertility can be assessed and treated at one sitting.^{2,3,4,5,8}

Objective of Study

The objectives of the study are:

1. To evaluate various etiological factors in infertility by hysterolaparoscopy.
2. To evaluate therapeutic interventions done during hysterolaparoscopy

Study Place and Period

The study was conducted in the Post Graduate Department of Obstetrics and Gynaecology, Hi-Tech Medical College & Hospital, Bhubaneswar, Odisha, India between 1st November 2018 to 31st October 2020.

Study Design: Prospective study

Sample Size: 70

Inclusion Criteria

1. Women with primary or secondary infertility
2. Infertility for more than 3 years
3. Women aged more than 20 years with infertility
4. Women with failed ovulation induction for a minimum of 3 cycles

5. Abnormal findings in Hysterosalpingography (HSG)

Exclusion Criteria

1. Medical disorders which are contraindications for general anaesthesia
2. Active pelvic infections
3. Associated male factor of infertility

The study was a prospective study of 70 patients with infertility. After approval of the local ethics committee, a written consent was obtained from all patients before starting the study. The flowchart of the participants is shown in Fig. 1.

The detailed medical history was taken in all cases. This was followed by a detailed medical examination and relevant examination of the husband. Only cases with no male factor of infertility were taken for this study.

The investigations consisted of initial routine examinations of blood, especially haemoglobin percentage, total WBC, DC, ESR, urine routine, serological test for syphilis, HIV, HbsAg, HCV, Blood grouping and Rh typing, blood hormonal tests like FSH, LH, prolactin and thyroid profile was done. Patient was admitted one day prior to the procedure and a pre-anaesthetic check-up was done. The hysterolaparoscopy was done in the follicular phase. An informed consent was obtained from all the patients participating in the study.

Hysterolaparoscopy was performed under general anaesthesia and the patients were kept for a period of 24 hours in the hospital post-operatively. Surgical interventions were carried out whenever required. First, hysteroscopy was performed to visualize the uterine cavity, ostia, endocervical canal and then observations made on laparoscopy were systematically recorded in the following way: General findings: To start with, a general assessment of the peritoneal cavity, especially the lower part of abdomen and pelvis was made to note any obvious pathology in the form of adhesions or any gross deviations from the normal appearances.

Uterus: The size and shape of the uterus was recorded. Any apparent congenital malformations

like arcuate uterus, bicornuate uterus or rudimentary uterine horn was looked for and recorded. If adhesions existed between the uterus, adnexa, omentum etc, that was also recorded.

Tubes : In order to obviate any confusion, initially the round ligament on the side under investigation was identified and visualized. Then the fallopian tube was traced from the cornual end to fimbrial end.

Ovaries: The size and shape of the ovaries were carefully noted. If one or both ovaries were found

cystic, then a visual assessment in respect of Stein-Leventhal syndrome was made. Any recently ruptured follicle, if visualized was recorded.

Pelvic peritoneum, including Pouch of Douglas: Any pathology in the form of endometriosis, pelvic inflammation or residual adhesions was recorded when seen.

Uterovesical pouch: Observed for any evidence of endometriosis, adhesions and tubercles

Tubal patency test: Done under vision by instilling methylene blue dye intracervically.

Table 1 Type of Infertility

Primary infertility	53 (76%)
Secondary infertility	17 (24%)
Total	70

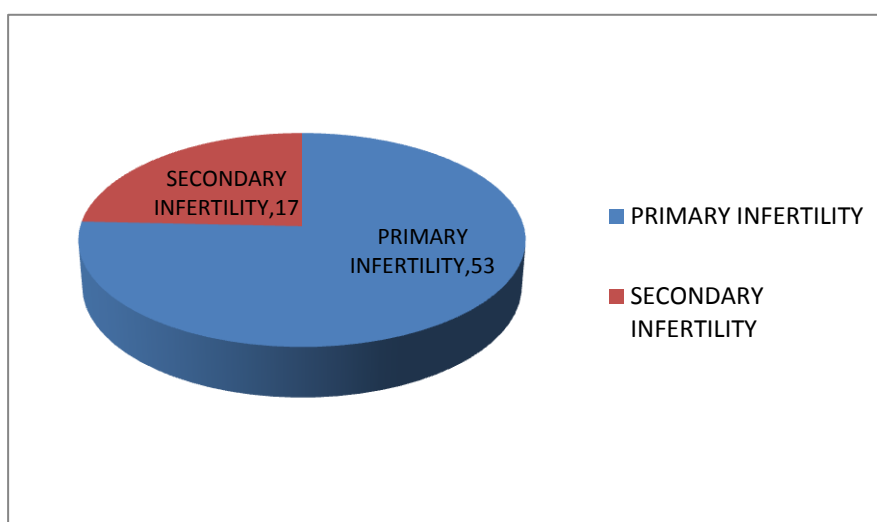


Figure – 1 Type of Infertility

Table -2 Distribution of the patients by Age

Age in Years	Primary Infertility	Secondary Infertility	Total
21-25	21 (30%)	01 (1.4%)	22 (31.4%)
26-30	22 (31.4%)	09 (13%)	31 (44.2%)
31-35	08 (11.4%)	04 (5.7%)	12 (17.1%)
36-40	02 (2.8%)	03 (4.2%)	05 (7.1%)
TOTAL	53	17	70

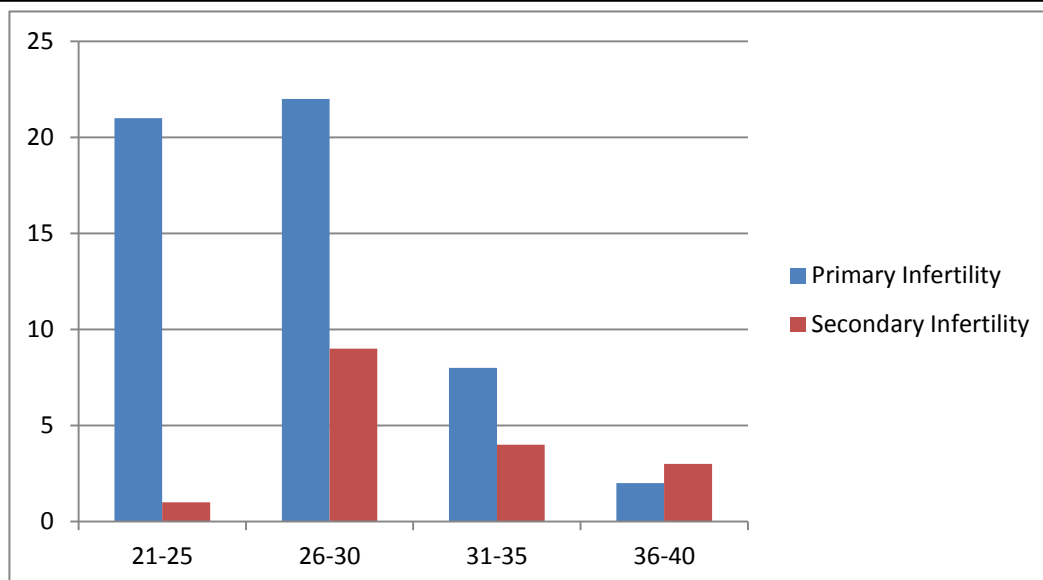


Figure – 2 Distribution of the Patients by Age

Table - 3 Duration of Infertility

Duration of Infertility	Primary Infertility	Secondary Infertility	Total
1-5 Years	31 (44%)	14 (20%)	45 (64.2%)
6-10 Years	21 (30%)	03 (4.2%)	24 (34.2%)
10-15 Years	01 (1.4%)	00 (0%)	01 (1.4%)
Total	53	17	70

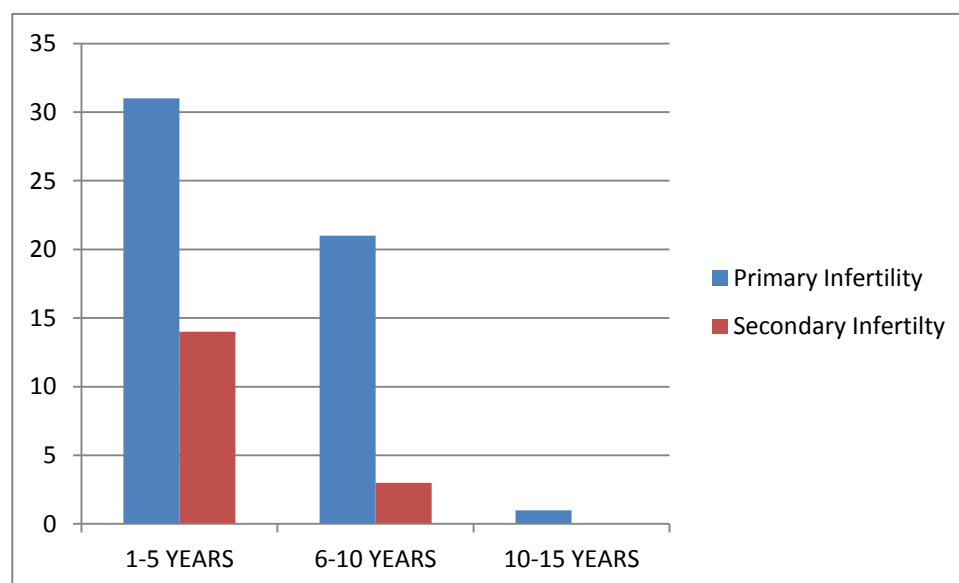


Figure – 3 Duration of Infertility

Table - 4 Menstrual History

Normal	31 (44%)
Infrequent Cycles	26 (37%)
Heavy Menstrual Bleeding	11 (16%)
Frequent Cycles	01 (1.4%)
Scanty Flow	01 (1.4%)
Total	70

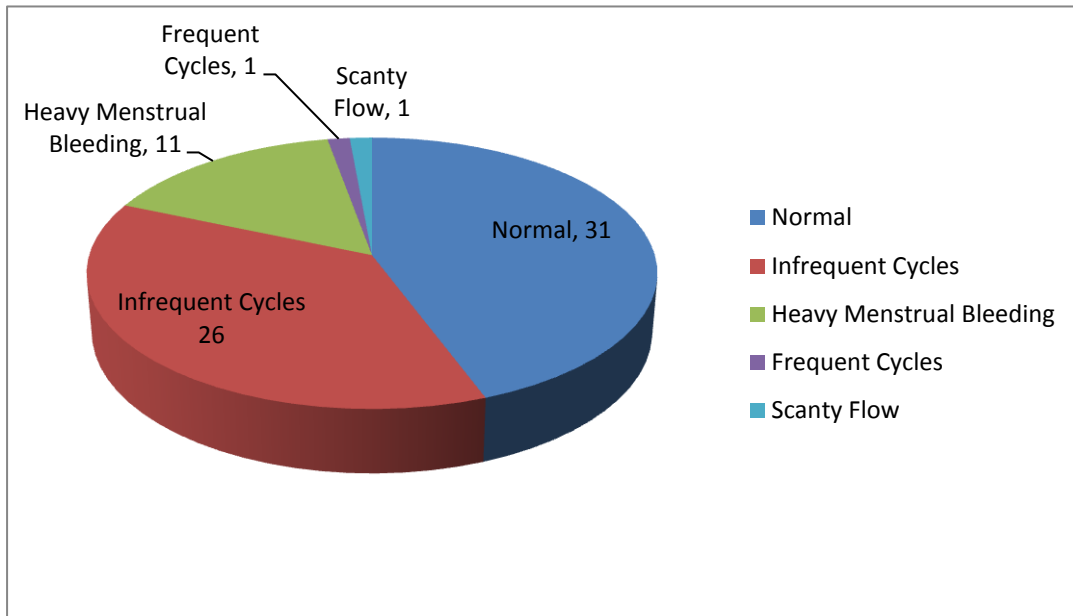


Figure - 4 Menstrual History

Table - 5 Obstetric History in Secondary Infertility

Previous LSCS	10 (59%)
Vaginal Delivery	04 (23.4%)
Previous Miscarriage	03 (18%)
Total	17

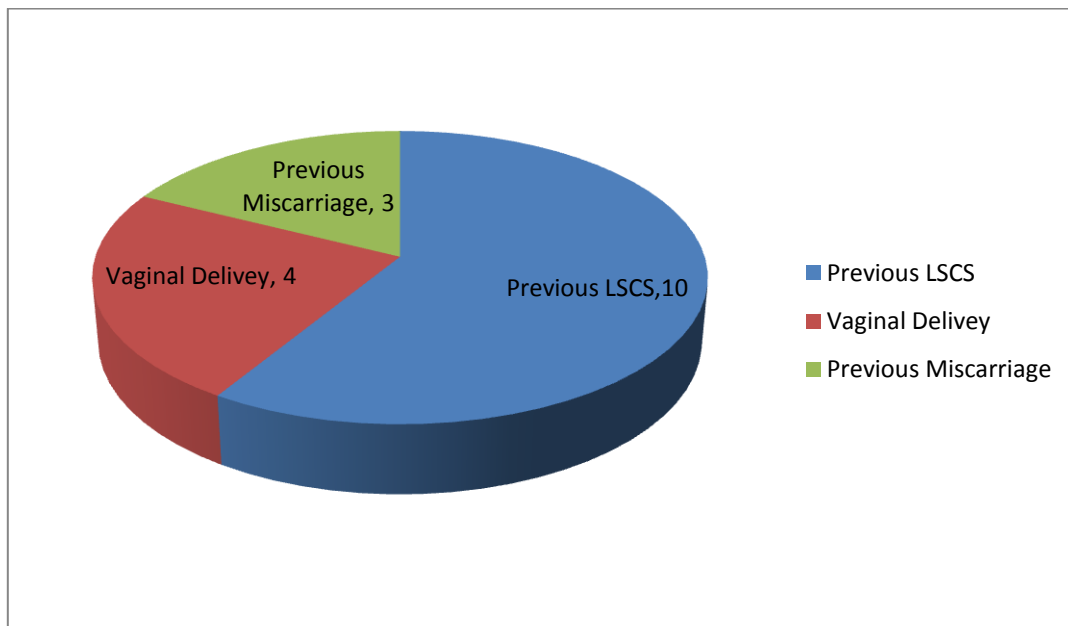


Figure – 5 Obstetric History in Secondary Infertility

Table - 6 Hysteroscopic Findings

Endometrial Polyp	08 (11.4%)
Cervical Stenosis	02 (2.8%)
Submucous Fibroid	03 (4.2%)
Septate Uterus	01 (1.4%)
Tubal Ostial Block	01 (1.4%)
Normal	55 (79%)
Total	70

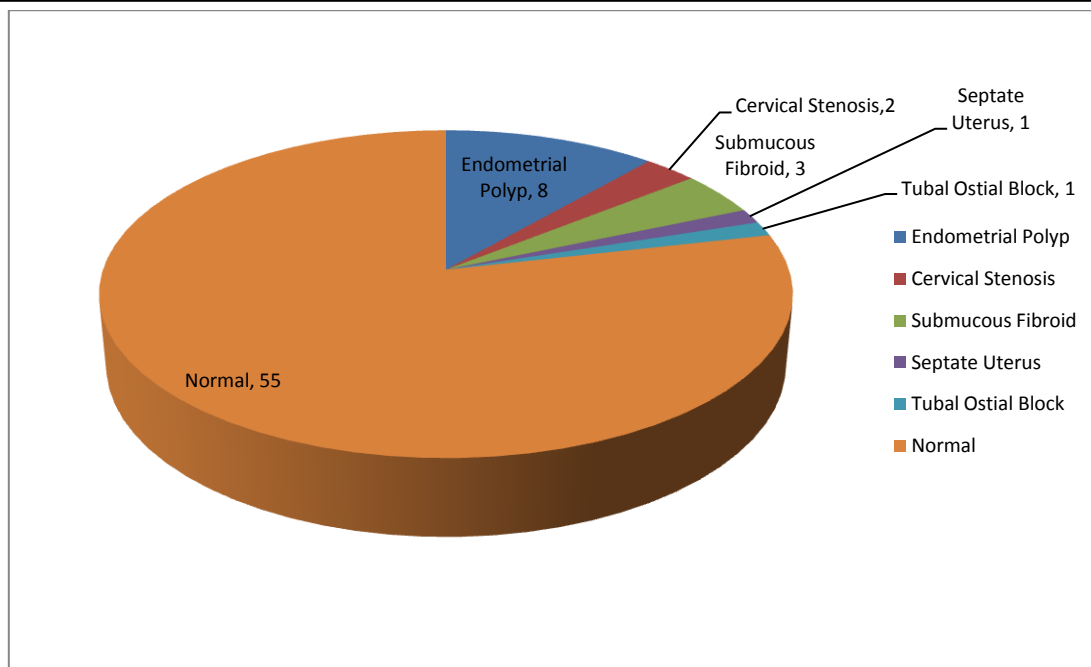


Figure - 6 Hysteroscopic Findings

Table - 7 Laparoscopic Findings

Polycystic Ovaries	24 (34.2%)
Endometriosis	8 (11.4%)
Bilateral Tubal Block	8 (11.4%)
Unilateral Tubal Block	04 (5.7%)
Pelvic adhesion	05 (7.1%)
Myomas	04 (5.7%)
Uterine anomaly	02 (2.8%)
Fitz-Hugh-Curtis Syndrome	01 (1.4%)
Normal	14 (20%)
Total	70

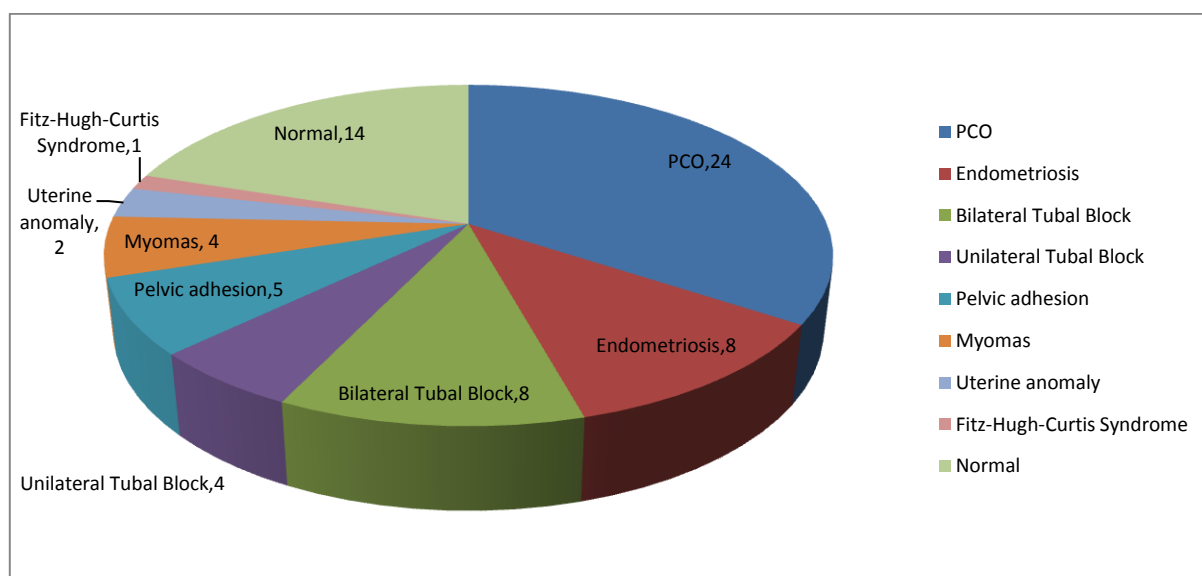


Figure- 7 Laparoscopic Findings

Table – 8 Type of Infertility

STUDY	PRIMARY	SECONDARY
Boricha Y.G. et al (2011)	35 (70%)	15 (30%)
Present Study	53 (76%)	17 (24%)

Table – 9 Distribution of the patients by age

STUDY	21-25 YEARS		26-30 YEARS		31-35 YEARS		36-40 YEARS	
	PI	SI	PI	SI	PI	SI	PI	SI
Boricha Y.G. et al (2011)	15 (43%)	-	-	06 (40%)	-	-	-	-
Present Study	21 (30%)	01 (1.4%)	22 (31.4%)	09 (13%)	08 (11.4%)	04 (5.7%)	02 (2.8%)	03 (4.2%)

Table – 10 Duration of Infertility

STUDY	1 - 5 YEARS		4 - 7 YEARS		6 -10 YEARS		10 - 15 YEARS	
	PI	SI	PI	SI	PI	SI	PI	SI
Boricha Y.G. et al (2011)	-	-	19 (54%)	07 (45%)				
Present Duty	31 (44%)	14 (20%)	-	-	21 (30%)	03 (4.2%)	01 (1.4%)	00 (0)

Table – 11 Menstrual History

STUDY	Godinjak Z et al (2008)	Present Study
Normal Flow	-	31 (44%)
Infrequent Cycles	18 (36%)	26 (37%)
Heavy Menstrual Bleeding	09 (18%)	11 (16%)
Frequent Cycles	00 (0%)	01 (1.4%)
Scanty Flow	3 (6%)	01 (1.4%)

Table – 12 Obstetric History In Secondary Fertility

STUDY	Previous LSCS	Vaginal Delivery	Previous Miscarriage
Marsha E wolf et.al (1990)	04 (6.5%)		
Present Study	10 (59%)	04 (23.5%)	03 (18%)

Table – 13 Hysteroscopic Findings

STUDY	SajidaParveen et al (2009)	Godinjak Z et al (2008)	Shakya et al (2009)	Present study
Endometrial polyp	06 (9%)	26 (7%)	03 (6%)	08 (11.4%)
Cervical stenosis	-	-	-	02 (2.8)
Submucous Fibroid	01 (1%)	-	01 (2%)	03 (4.2%)
Septate Uterus	02 (3.2%)	07 (1.8%)	02 (4%)	01 (1.4%)
Tubal Ostial Block	-	-	-	01 (1.4%)
Normal	-	-	44 (88%)	55 (79%)

Table – 14 Laparoscopic Findings

Study	Sajida et al (2009)	Godinjak Z et al (2008)	Present Study
PCO	12 (19%)	-	24 (34.2%)
Endometriosis	05 (8%)	51 (14%)	08 (11.4%)
B/L Tubal Block	10 (16%)	18 (5%)	8 (11.4%)
Unilateral Tubal Block	12 (19.3%)	30 (8%)	04 (5.7%)
Pelvic adhesions	07 (11.2%)	40 (11%)	05 (7.1%)
Myomas	04 (6.4%)	31 (8%)	04 (5.7%)
Uterine Anomaly	08 (12.9%)	19 (5%)	02 (2.8%)
Fitz Hugh Curtis syndrome	-	23 (6%)	01 (1.4%)
Normal	-	-	14 (20%)

Results

In the present study, out of 70 cases of infertility that were evaluated, primary infertility cases were 53 (76%) [Table -1] and secondary infertility cases were 17 (24%). In our study, the most common age group [Table-2] was between 26 to 30 years, and amongst them 22(31.4%) were with primary infertility and 9(13%) were with secondary infertility . This was followed by age group between 21 to 25 years, where primary infertility were amongst 21(30%) and secondary infertility was in 1(1.4%), followed by age group between 31 to 35 years , where primary infertility were amongst 8(11.4%) and secondary infertility were amongst 4(5.7%) and in between the age group 36 to 40 years , 2 (2.8%) patients were with primary infertility and 3 (4.2%) were with secondary infertility . In our study, in 45(64.2%) cases, the duration of infertility [Table-3] was from 1 to 5 years. Amongst those 45 cases, primary infertility were 31(44%) and secondary infertility were 14 (20%). In 24 (34.2%) cases, the duration of infertility was from 6 to 10 years.

Amongst these 24 cases, primary infertility were 21(30%) and 3(2.4%) were with secondary infertility. In 1(1.4%) case, the duration of infertility was from 10 to 15 years, where the 1(1.4%) patient was with primary infertility. In our study, regarding menstrual pattern [Table-4], amongst 70 cases studies, 31(44%) cases had regular cycles followed by 26(37%) had infrequent cycles, 11(16%) had heavy menstrual bleeding and 1(1.4%) each had frequent cycle and scanty flow. In the present study [Table-5], out of 17 cases of secondary infertility, 10(59%) of them had previous cesarean delivery, 4(23.5%) had previous vaginal delivery and 3(18%) of them had previous miscarriage. In our study, out of the 70 cases studied, 55(79%) had normal hysteroscopic findings [Table-6], 8(11.4%) had endometrial polyps, 3(4.2%) had submucous fibroid, 2(2.8%) had cervical stenosis and 1(1.4%) each had septate uterus and tubal ostial block. In our study, laparoscopy findings of 70 cases (Table-7) evaluated for infertility were as follows, 24

(34.2%) had polycystic ovaries, 8(11.4%) had endometriosis, 8(11.4%) had bilateral tubal block, 5 (7.1%) had pelvic adhesions, 4(5.7%) had unilateral tubal block, 4 (5.7%) had myomas, 2 (2.8%) had uterine anomalies, 1(1.4%) had Fitz-Hugh-Curtis syndrome and 14(20%) showed normal study.

Discussion

Infertility is defined as failure to achieve pregnancy within a year of regular unprotected intercourse. Intra-cavitary pathology includes submucous leiomyomas and endometrial polyps. Those pathologies often result in abnormal uterine bleeding, infertility or both. Congenital anomalies of the female reproductive system are associated with higher rate of infertility. Diagnostic hysteroscopy offers a reliable evaluation of the uterine cavity and subsequent detection of uterine disease.^{11,12,13,14}

Complication rates of diagnostic hysteroscopy are as low as 0.012%.² Incidence of uterine congenital anomalies is not accurately known. Discrepancy is a result of inaccurate diagnostic methods, lack of uniform system of classification and many of them are asymptomatic. Mean prevalence of uterine malformation in general population and in the population of fertile women is approximately 4.3%, in infertile women approximately 3.5% and in women with history of recurrent pregnancy losses approximately 13%. The incidence of uterine anomaly is 7.6%. Uterine septum is a major cause of pregnancy loss. Hysteroscopic septal resection is a safe and efficacious procedure.^{9,15,24,26,30} Endometrial polyps are considered amongst factors that might contribute to infertility and recurrent pregnancy loss.^{15,16} It has been postulated that congenital uterine anomalies and acquired structural cavity defects like leiomyomas,^{18,19,20,21,22} endometrial polyps and synechiae^{23,25,29} might have negative impact on endometrial receptivity and thus on fertility.

In the present study, out of 70 cases of infertility that were evaluated, primary infertility cases were 53 (76%) and secondary infertility cases were 17

(24%), which was in comparison to the study group of Boricha Y G et al (2011),³³ where primary infertility cases were 35 (70%) and secondary infertility cases were 17 (24%) out of the 50 cases studied. [Table-8]

In our study, the most common age group was between 26 to 30 years, and amongst them 22(31.4%) were with primary infertility and 9(13%) were with secondary infertility. In the comparison study by Boricha Y. G et al 2011 [Table-9], primary infertility was most prevalent in the age group 21 to 25 years, which was 15 (43%) and secondary infertility was most prevalent in 26 to 30 years, which was 6 (40%).

In our study, maximum number of cases, 45(64.2%) had duration of infertility of 1 to 5 years for both primary infertility and secondary infertility. In the comparison group by Boricha Y.G et al (2011), [Table-10] maximum number of cases had duration of infertility between 4 to 7 years, in both primary infertility and secondary infertility. 19(54%) cases had primary infertility and 7(45%) cases had secondary infertility.

In our study, regarding abnormal menstrual pattern, majority, 26(37%) had infrequent cycles. In the comparison study by Godinjak Z et al (2008) also [Table-11], the majority of patients, 18(36%) had infrequent cycles. In the present study, out of 17 cases of secondary infertility, 10(59%) of them had previous cesarean delivery, 4(23.5%) had previous vaginal delivery and 3(18%) of them had previous miscarriage. In the comparison study group Marsha E. Wolf et al (1990)³⁵ [Table-12], 4(6.5%) out of 61 cases studied had secondary infertility following previous LSCS.

In our study, out of the 70 cases studied, majority, 55(79%) had normal hysteroscopic findings. The most common abnormal hysteroscopic finding was endometrial polyp.^{6,7} 8(11.4%) cases had endometrial polyps. In comparison with Sajida Parveen et al (2009)³⁶ [Table-13], myomas^{27,28} were found in 1(1%), endometrial polyps were found in 6 (9%), Asherman syndrome in 2 (3.2%), uterine anomalies were found in 8(12.9%) patients

including arcuate uterus in 4(6.45%), septate uterus in 2(3.2%), bicornuate and uterine didelphys in one each out of total 62 cases studied. Studies by Godinjak Z et al (2008)³⁴ and Shakya et al (2009) also showed endometrial polyps as the predominant abnormal hysteroscopic finding with 26(7%) and 3(6%) cases respectively. Anomalies of the uterus are considered to be one of the reasons of infertility in women, and for this reason diagnostic hysteroscopy is fundamental in screening in infertility. Considering the low complication rates, minimal time requirement and negligible effect on the post-operative course, hysteroscopy could be performed on all infertile women undergoing diagnostic laparoscopy. The hysteroscopy showed normal cavity in 79% cases, giving a false negative rate of 12% for hysterosalpingography.

Diagnostic laparoscopy is the standard means of diagnosing the tubal pathology, peritoneal factors, endometriosis and intra-abdominal causes of infertility. Laparoscopy often reveals pelvic pathology as endometriosis, PCOD, pelvic and periadnexal adhesions that result in change of treatment. In our study, the most common abnormal laparoscopic finding was polycystic ovaries. Out of 70 cases evaluated for infertility, 24 (34.2%) had polycystic ovaries. 8(11.4%) each had endometriosis and bilateral tubal block.¹⁰ In comparison, in the study group by Sajida Parveen et al (2009) [Table-14], 5 (8%) were found to have endometriosis, 12(19.35%) had polycystic ovaries(PCOD), and 3(4.8%) had functional cysts of ovary, pelvic adhesions were found in 7(11.2%) patients, myomas in 4(6.45%) and uterine anomalies in 8(12.9%) of patients.

Thus, diagnostic hystero-laparoscopy must be part of an infertility work-up in primary and secondary infertility.^{31,32}

Conclusion

Hystero-laparoscopy is a feasible and acceptable procedure and it can be used as "One-time approach" in the assessment of female infertility caused due to pelvic pathology, helps in

diagnosing of certain factors causing infertility which cannot be diagnosed by any other method such as by USG or HSG and gives us information as to whether surgery is required and if so the nature of surgery most suitable for the patient.

It is concluded that while investigating the causes of female infertility, combined simultaneous diagnostic laparoscopy and hysteroscopy should be performed in all infertile patients before treatment, especially in women with age more than 30 years. Many diagnostic tests for female infertility have screening value but the gold standards are laparoscopy and simultaneous hysteroscopy.

Ethical Approval: The study was approved by the Institutional Ethics Committee.

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