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Research Article

The Role of Laparoscopy in the Management of Infertility Patients: A Cross Sectional Study

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Abstract

Background and Objectives: *Infertility affects 10 – 15 % of couples is an important part of clinical practice for many clinicians. Laparoscopy is an important tool to assess the reproductive pathology including tubal patency in infertile women. In the same setting therapeutic intervention can be done.*

Objectives of the study: *To determine the definitive reproductive pathology using laparoscopy to provide the basis for treatment of infertility patients.*
To appraise the evidence on the effectiveness of laparoscopy in the treatment of female infertility.

Methods*: This is a crossectional study conducted on 95 women with primary infertility from 1/08/14 to 1/08/15 . Infertility work up included semen analysis, Ultrasonography, TSH, LH,FSH, serum prolactin. Women were subjected to laparoscopy under GA. Laparoscopic findings were noted and therapeutic interventions were done if required . Intra operative and post operative complications were noted.*

Result*: The mean age of women in the study was 28.6 yrs.The mean duration of infertility was 5.2 yrs. In 87.4% of the women pelvic pathology was noted on laparoscopy. Among these 33.6% of the women had undiagnosed pathology detected on laparoscopy. The pathology detected was polycystic ovaries (35.7%),tubal pathology(17.8%), tubal block(11.5%),pelvic adhesions(22.1%) endometriosis(15.7%). Therapeutic intervention was done in 75.7% of the women. There was difficulty in creating pneumoperitoneum in 2 women. None of the women had intraoperative or post operative complications.20 women conceived during the period of study.*

***Conclusion**: Ovulatory infertility(43%) and tubal infertility and adhesions (22%) are common causes of infertiliy. Laparoscopy is a valuable technique for the complete assessment of female infertilityand has successfully shortened the duration of infertility and increased the conception rate in my study. Hence laparoscopy can be used as a gold standard in the diagnosis and management of infertility particularly among the women whose*

1. Age > 30 YRS

2. Duration of infertility > 5 yrs

3. PCODS patients who are Gnrh resistant and high serum LH

4. Unexplained female infertility

and should be used early in the diagnostic work up

***Keywords**: Infertility, Laparoscopy.*

LIST OF ABBREVIATIONS

ART - Assisted Reproductive Technology

BMI - Body Mass Index

COH - Controlled Ovarian Hyper stimulation

CPR - Cumulative Pregnancy Rate

CPT - Chromopertubation

CHC - Chocolate cyst

DAD - Dense adhesions

DC - Dermoid cyst

DES - Diethylstilbestrol

ESHRE - European Society of Human Reproduction and Embryology

END - Endometrial deposites

FUL - Fulguration of endometrial spots

FSH - Follicle Stimulating Hormone

FLAD - Flimsy adhesions

GA - General Anaesthesia

GnRH - Gonadotropin Releasing Hormone

HC - Haemrrhagic cyst

HSG - Hysterosalphingography

ICSI - Intra Cytoplasmic Sperm Injection

IUI - Intrauterine Insemination

IOP - Intra operative complications

LH - Leutenizing Hormone

LOD - Laparoscopic Ovarian Diathermy

LPD - Leutal Phase Defect

ULF - Leutenised Unruptured Follicle

NOTES - Natural Orifice Transluminal Endoscopic Surgery

OB - Obliterated

OC - Ovarian cyst

OCY - Ovarian cystectomy

PCO - Polycystic ovaries

POP - Post operative complications

PCOD - Polycystic Ovarian Disease

PCOS - Polycystic Ovarian Syndrome

PCT - Post Coital Test

PHAD - Peri hepatic adhesions

PTAD - Peri tubal adhesions

SILS - Single Incision Laparoscopic Surgery

TSH - Thyroid Stimulating Hormone

USG - Ultrasonography

WHO - World Health Organization

Introduction

Infertility affects 10 – 15 % of couples and an important part of clinical practice for many clinicians **[1].** Its overall prevalence has been stable during the past 50 years; however, a shift in etiology and patient age has occurred; As the woman's age increases, the incidence of infertility also increases. In our country a stable family structure and the desire for children are the norm and there is also a social stigma associated with infertility. As a result these two, there is an ever increasing demand for diagnostic and therapeutic intervention for the management of infertile couple.

Laparoscopy provides both panoramic view of pelvic reproductive anatomy and a magnified view of uterine, ovarian, tubal and peritoneal surfaces and its pathology. It can confirm a clinical impression, establish a definite diagnosis, follow the course of a disease, and modify the treatment. Certain operative procedures (tubal sterilization, ovarian cyst aspiration, or biopsy of intraperitoneal structures) can be accomplished through the laparoscope**. [2]**

In the same setting therapeutic interventions like adhesiolysis, PCOD drilling, cystectomy etc. can be performed in these patients. Thus laparoscopy offers both diagnostic and therapeutic advantage to the infertile patients.With bulk of patients belonging to lower socioeconomic status this study offers the advantage of laparoscopy to needy infertile patients. Infertility is a common complaint that warrants evaluation, and often times necessitate scrutiny by laparoscopy.**[3]**

Since morphological abnormalities of the Fallopian tubes can be visualized directly under laparoscopy, it is generally accepted as the gold standard in diagnosing tubal pathology and other intra abdominal causes of infertility.

DEFINITION OF INFERTIITY

- Infertility is the failure to conceive (regardless of cause) after 1 year of unprotected intercourse.

Role of laparoscopy in current fertility practice

- Laparoscopy was introduced to clinical practice in the early part of this century and its use in gynecology was described in 1967.
- Laparoscopy is a trans-peritoneal endoscopic technique that provides excellent visualization of pelvic structures and often permits the diagnosis of gynecologic disorders and pelvic surgery without laparotomy **.[41]**
- It provides direct visualization of pelvis and complete view of cul-de-sac Laparoscopy allows for the comprehensive evaluation of the pelvis including confirmation of tubal patency and evaluation of tubo-ovarian relationships. Pelvic adhesions, endometriosis, and tubal disease can be assessed and in most circumstances, simultaneously treated in a relatively noninvasive outpatient procedure.**[42]**
- Laparoscopy was the final diagnostic procedure of the female fertility exploration, a sout lined by the American Fertility Society in 1992 and by the World Health Organization guidelines**. [7]**
- Glatstein et al. (1997) reported that 89% of all reproductive endocrinologists in the USA routinely performed a laparoscopy in the diagnostic work-up of infertility.**[8]**
- However, some investigators showed that the diagnostic laparoscopy did not reveal any pathology or only minimal and mild endometriosis in 40–70% of all cases. **[9]**
- Already by the mid-1990's, the test ‘diagnostic laparoscopy’ failed to be an ideal predictor for infertility. **[10]**
- These findings convinced some authors to challenge the need for this procedure in the work-up of infertility. **[11]**
- Disadvantages of diagnostic laparoscopy include the need for general anaesthesia, patient's anxiety and the possibility of adhesion formation.
- In a large Finnish follow-up study, the complication rate of diagnostic laparoscopy was 0.6 per 1000 procedures.**[12]**

- However, advantages include the possibility to perform both diagnosis and therapy at the same time, and the opportunity to combine the laparoscopy with the hysteroscopic exploration of the uterine cavity with an endometrial biopsy, all as part of day care surgery.
- Diagnostic laparoscopy is an essential part of full assessment and treatment of infertility. **[13]**
- It provides information regarding tubal status, any pelvic adhesions, ovarian and uterine pathology. **[14]**

Laparoscopy in PCOS

- J.Cohen et al. (1972) reported 21 pregnancies resulting from 51 successive ovarian biopsies with laparotomy they came to the conclusion that this procedure was of therapeutical value for certain types of ovarian infertility. **[15]**
- Gjoannaess (1984) proposed the use of laparoscopic multi electro cauterization in the treatment of PCOS. He achieved an ovulation rate of 92% and a pregnancy rate of 69%.
- In a 1989 publication, after a follow-up of 10 years, Gjoannaess reported the outcome of pregnancy of 89 women who conceived after electro cauterization. The abortion rate was15%, which is less than after clomiphene treatment or wedge resection. **[16]**
- In a recent Cochrane review (Farquhar et al., 2005), the efficacy of laparoscopic drilling of the ovarian capsule (laparoscopic ovarian diathermy, LOD) by diathermy or laser in clomiphene resistant PCOS has been compared to gonadotrophin treatment based on a total of 15 RCTs. The reviewer's conclusion is that there is no difference in the live birth rate and the miscarriage rate in women with clomiphene resistant PCOS undergoing LOD when compared with gonadotrophin treatment. However, the reduction in multiple pregnancy rate in women undergoing LOD makes this option attractive. **[17]**

Laparoscopic adhesiolysis

- Adhesions may form due to prior infection, such as a ruptured appendix or pelvic inflammatory disease (PID), endometriosis, or previous surgery. Peritubal adhesions may impair ovum pick due to

decrease in tubal motility. It is said that laparoscopic adhesiolysis might increase the spontaneous pregnancy rates as well as pregnancy rates after IUI. **[18]**

Laparoscopy in endometriosis

- Laparoscopy is the gold standard procedure used to diagnose and treat endometriosis.
- Endometriotic lesions may be resected or ablated using any of the power instruments. Both of these techniques have shown to improve fertility and decrease pelvic pain in multiple well-designed studies.
- Review of literature revealed that, the ablation of endometriotic lesions with adhesiolysis to improve fertility in minimal and mild endometriosis is effective compared to diagnostic laparoscopy alone **[19,20]**
- The ESHRE Special Interest Group for Endometriosis who has recently developed guidelines for the diagnosis and treatment of endometriosis recommends surgical treatment for minimal or mild endometriosis in infertile women, but also mentions that some members of the working group questioned the strength of the evidence of the recommendations in the meta-analysis of Jacobson.**[20]**

Laparoscopy before IVF treatment

- With respect to hydrosalpinx, two RCTs have demonstrated increased implantation and pregnancy rates in IVF cycles after salpingectomy for ultrasonically visible hydrosalpinges**[21,22]**, Both these trials have been included in a recent Cochrane review(Johnson *et al.*, 2004) .
- According to the meta-analysis by Johnson *et al.*, 2004, eight women would have to undergo salpingectomy prior to IVF to gain one additional live birth**[22]**
- In a retrospective case-controlled study, Garcia-Velasco *et al.* (2004)demonstrated that laparoscopic removal asymptomatic small endometriotic cysts (<3 cm),immediate proceeding to IVF may reduce the time to pregnancy, treatment costs and the possible detrimental effects of inappropriate surgery on the ovarian function **[23]**
- However, laparoscopic cystectomy of larger symptomatic endometriotic cysts (>4 cm) improves fertility and reduces recurrence of these cysts when compared to cyst drainage and coagulation**[23-**

25,6]

Myomectomy

- Studies have shown longer operative times and a higher conversion to laparotomy rate associated with the use of GnRH agonists in laparoscopic myomectomy due to difficult cleavage planes.
- An injection of vasopressinin to the uterus may help maintain hemostasis. The defect left by the fibroid must be sutured, which can be difficult laparoscopically for inexperienced practitioners. Barrier techniques may be used to decrease adhesion formation.
- The fibroid may be removed by morcellation or colpotomy. Power morcellators are available to expedite the process.
- However, all randomized clinical trials of myomectomy performed by laparoscopy versus laparotomy did not show an increased risk of rupture or poorer reproductive outcomes. These trials were conducted by experts in laparoscopic suturing and in carefully selected patients.

INSTRUMENTS

Image 1: Laparoscopy trolley

Image 2 : Light cable and light source

Protocol

The women were admitted in their proliferative phase, day prior to the procedure for Pre anaesthetic evaluation as per the hospital protocol. Relevant investigations were carried out. Mechanical bowel preparation was done using polyethelene glycol preparation.

Procedure

- General anaesthesia was administered.
- Patient was placed in dorsal lithotomy position with buttocks extended over the edge of the table for easier manipulation of uterine manipulator.
- Laparoscope entry was made using closed technique.
- Carbon dioxide was used for insufflation. Halogen light source with fibre optic cable and three chip camera with external video monitor were used for the procedure.
- Inspection of the abdominal and pelvic organs was carried out in clock wise direction to visualise

the caecum ,appendix, ascending colon, right lobe of the liver ,gall bladder ,falciform ligament, left lobe of the liver, stomach, descending colon and sigmoid colon.

- With deep trendelenberg position and uterine manipulation pelvic organs were visualized.
- Ancillary instruments were used to aid full examination of fallopian tubes, ovaries and pouch of douglas.
- Intially uterus was inspected and proceeded in clockwise direction visualizing anterior culde sac, right adnexa, posterior culdesac, left adnexa, under durface of the ovaries and the fimbrial ends.
- Therapeutic intervention was done whenever required like ovarian drilling, adhesiolysis, cystectomy etc.
- A uterine cannula was used to inject diluted methylene blue dye to check for tubal patency. Ease of dye injection and number of flushing attempts required to visualize the tubal spill was noted.
- The procedure was terminated by evacuating insufflated gas through cannula followed by removal of all instruments and the incision was closed. Aseptic dressing was applied.
- Women were shifted to post operative ward and discharged after 24 hrs of observation.
- The data was collected on a proforma and analysed
- The patients are followed up in the subsequent visits.

Image 3 : Laparoscopy being performed

Image 4: Ovarian drilling for polycystic ovaries

Aims and Objectives

- To determine the definitive reproductive pathology using laparoscopy to provide the basis for treatment of infertility patients
- To appraise the evidence on the effectiveness of laparoscopy in the treatment of female infertility.

Materials and Methods

This is a cross-sectional study conducted over a period of one year 1/8/14 to 1/8/15.

- 95 Women attending infertility clinic, at the Department of Obstetrics & Gynaecology, SRM medical college and RC over a period of 1 year from 1/08/14 to 01/08/15 were offered the study entry.
- All the participants underwent standard infertility evaluation.
  - History,
  - Physical examination,
  - Ultrasonography,

- Hormonal assay involving TSH, FSH, LH and serum prolactin and semen analysis.

- A pre informed questionnaire was conducted
- Informed voluntary consent obtained.
- Women were subjected to laparoscopy under GA.
- Laparoscopic findings were noted and therapeutic interventions were done if required.
- Intra operative and post operative complications were noted.
- Women were shifted to post operative ward and discharged after 24 hrs of observation.
- The data was collected on a proforma and analysed.

Inclusion criteria

Women with primary and secondary infertility after informed written consent**.**

Exclusion criteria

- Patients with cardiac disease.
- Patients with severe anemia.
- Patients with severe obstructive lung disease.

Sample Size: 95

Statistical Analysis:

- The descriptive analysis of the data is done using, Statistical software namely SPSS.
- Graphs and tables were generated using Microsoft word and excel

Results

Ninety five patients underwent diagnostic laparoscopy for primary infertility between 1/08/14 to 1/08/15.

Table 1: Pattern of Infertility

TYPE OF INFERTILITY	Count
I	64
II	31
Grand Total	**95**

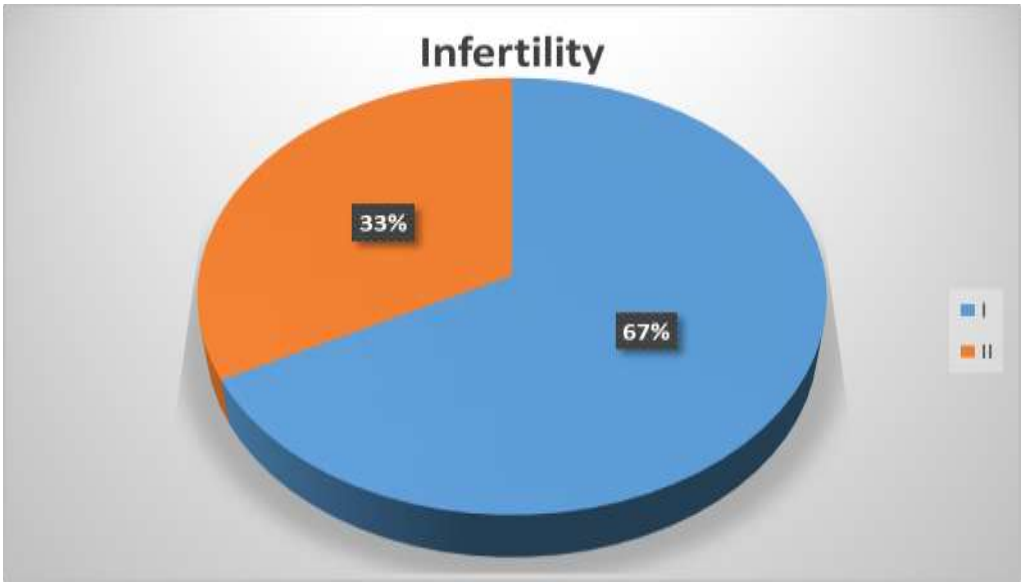


Table 1 shows that 67 % of the women belong to primary infertility and 33% of the women belongs to secondary infertility

Table 2: Age distribution of patients

- Table 2 shows the age distribution of patients. 79 % of the women were aged between 20 – 30 yrs.
- 18% of the women were less than 25 yrs
- 82 % of the women were more than 25 yrs.
- The mean and median age of the women in the study was 28.6 yrs & 28 yrs respectively.

Age Range	Count
20- 25	15
25-30	49
30 – 35	16
35 – 40	14
>40	1

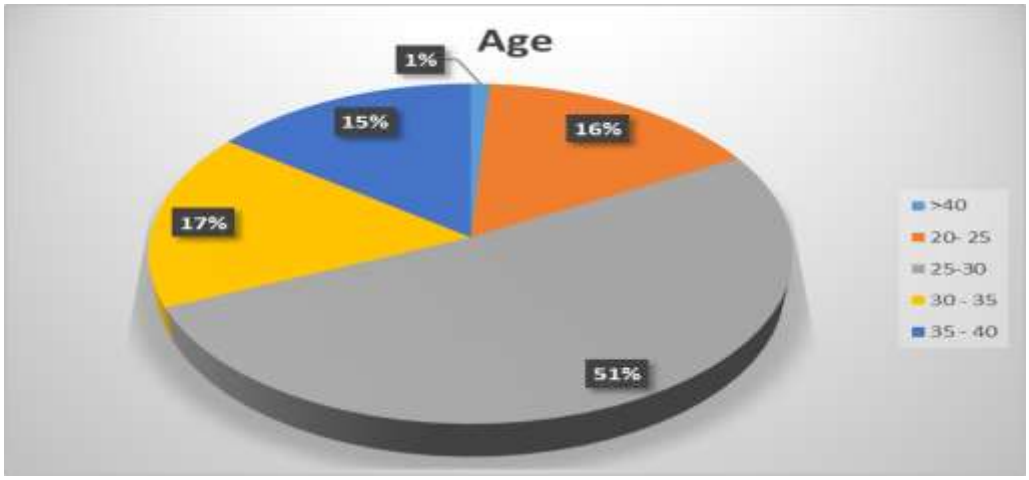
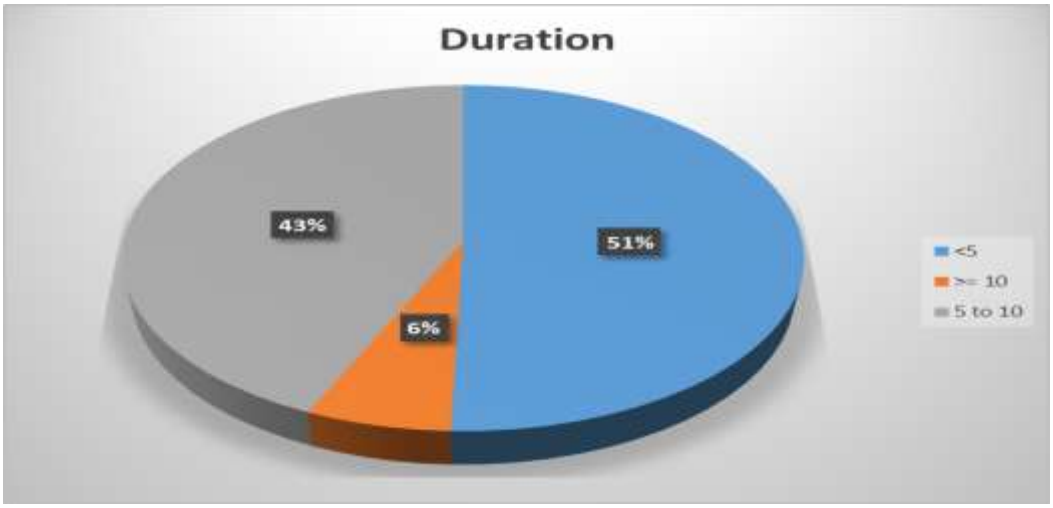


Table 3: Duration of infertility

Duration	Count
<5	48
>5 to 10	41
>= 10	6



The mean duration of infertility is 5.2 years

Table 4: Duration of infertility with respect to age

	Duration of Infertility		
Age Distribution	**<5**	**5 to 10**	**10 to 20**
<25	12	3	0
25 to 30	27	18	4
30 to 40	9	20	1
>40	0	0	1

- 41% of the women had duration of infertility between 6 to 10 yrs and
- 48 % had less than 5 yrs of infertility .
- Only 6 women had duration of infertility more than 10 yrs.
- As depicted in the table with increasing age there is increase in duration of infertility.

Table 5 : Pattern of menstrual cycles

- 53 women had irregular cycles
- 47 women had regular cycles

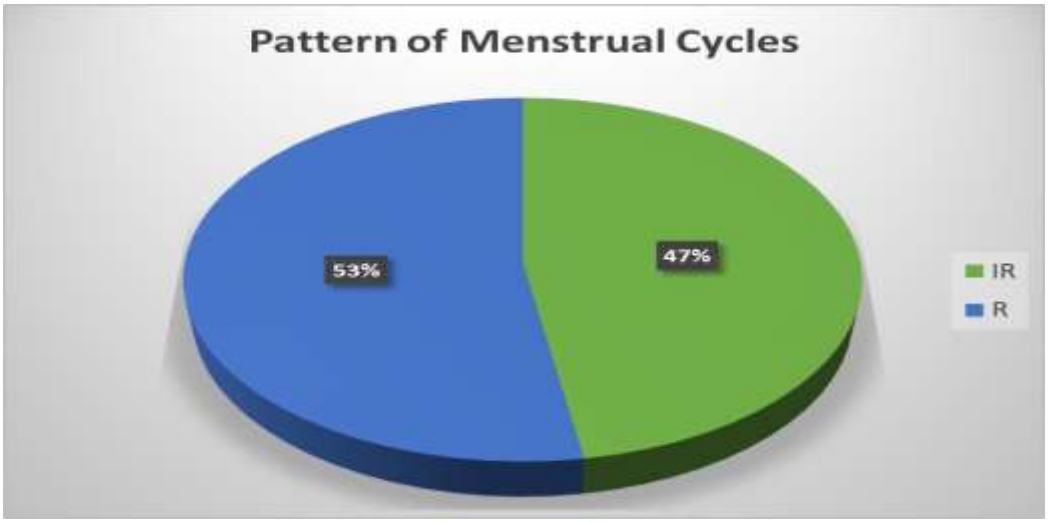
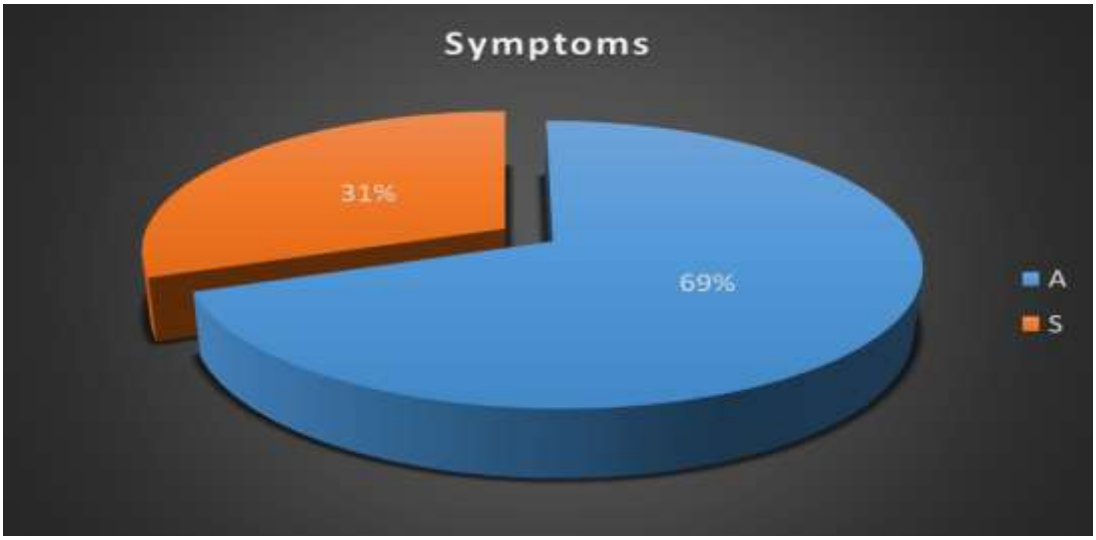


Table 6: Symptomatic women

Symptoms	Count
Asymptomatic	66
Symptomatic	29
Grand Total	**95**



- 31 % the women had symptoms like pain abdomen, dysmenorrhea, dysparenuia related to pelvic pathology like endometriosis

Table 7: Body mass index

Majority of the women (63%) had abnormal BMI.

BMI Range	Count
20 to 25	35
25 to 30	60

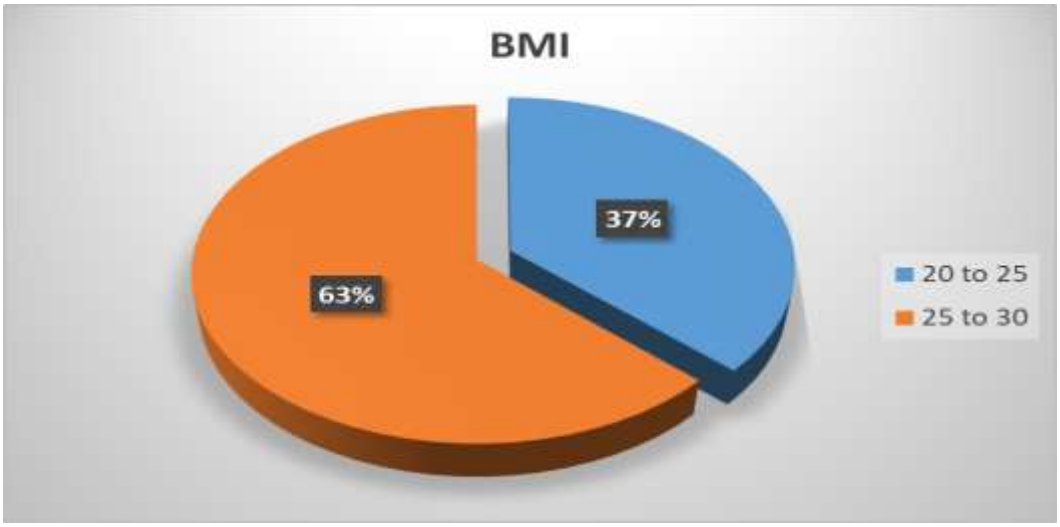


Table 8: BMI in relation to duration of infertility

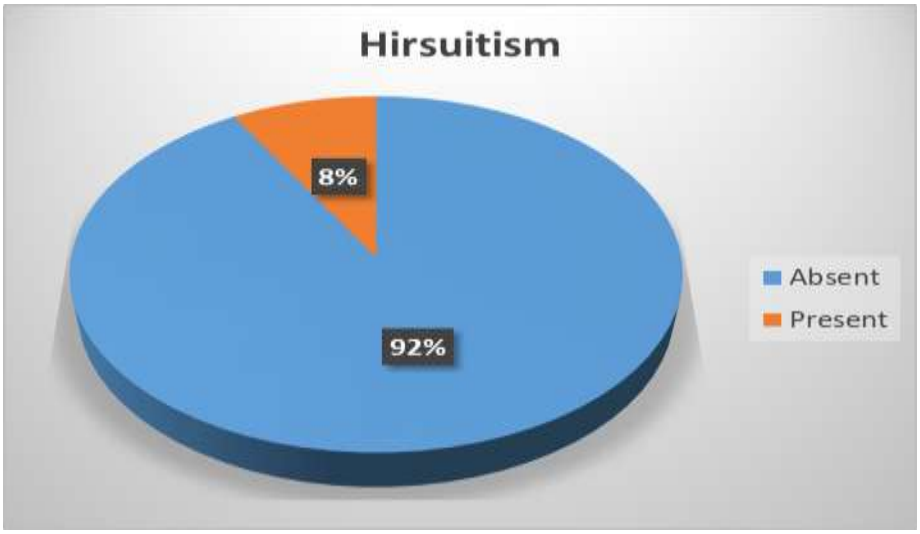
	Duration of Infertility		
BMI Range	**<5**	**5 to 10**	**10 to 20**
20 to 25	20	15	
25 to 30	28	26	6

As depicted above the duration of infertility is increased in women with abnormal BMI.

Table 9: Presence of hirsutism

9% of the women had hirsutism

Hirsuitism	Number
Present	8
Absent	87



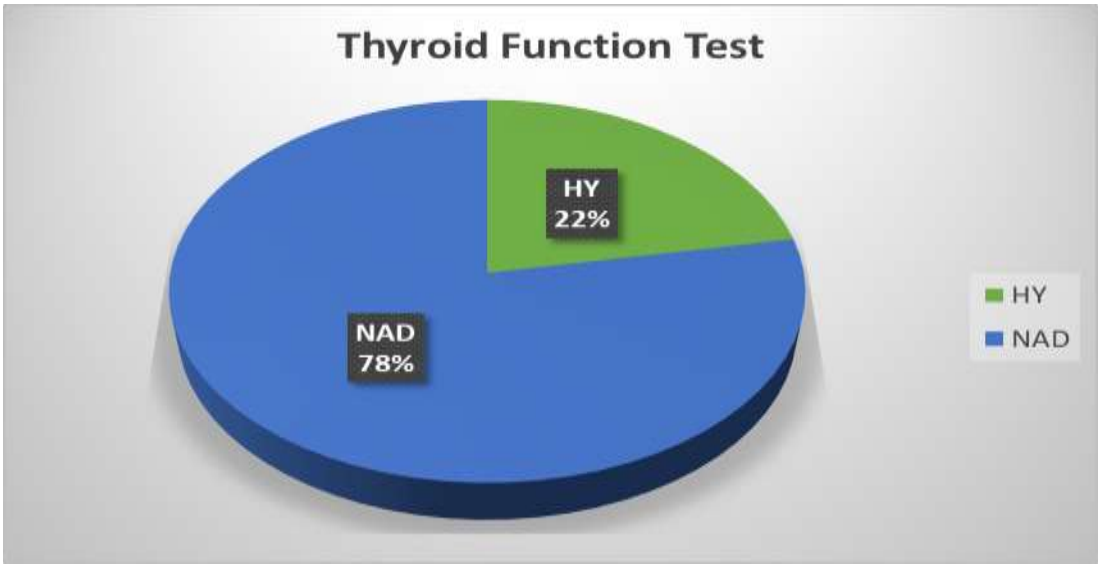
Galactorrhoea and serum prolactin

- 9% of the women in study had Galactorrhoea and 5% of women had raised serum prolactin.
- Six women had Galactorrhoea and raised serum prolactin

Most of these women have higher incidence of endometriosis in co-relation with laproscopy.

Table 10 : Thyroid function test

THYROID LEVELS	Count
HYPOTHYROIDISM	21
NAD	74
Total	**95**

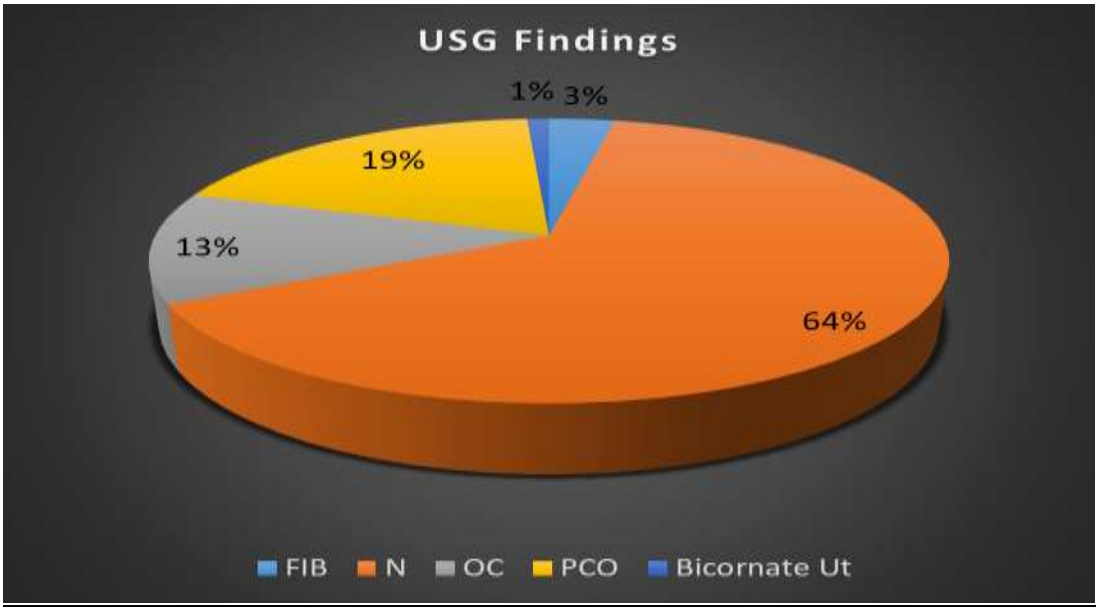


- 21 women had hypothyroidism among 95 infertile women, **most of them have PCOS in co-relation with laparoscopy findings.**

Table 11: Ultra-Sonographic findings

Pelvic ultrasonography was normal in 61 women, 18 women had polycystic ovaries diagnosed on ultrasound. 12 women had ovarian cyst, and another 3 had fibroid uterus, one had bicornuate uterus.

USG	Count
Normal	61
Fibroid uterus	3
Ovarian Cyst	12
PCO	18
Bicornate Ut	1
Total	**95**



LAPAROSCOPY FINDINGS

- In 87.4% of the women reproductive pathology was noted on laparoscopy.
- 12.6 %women had normal study.
- In 33.6% of the women reproductive pathology was freshly detected by laparoscopy, which was missed by other modalities like clinical examination and ultrasound.

Table 12 : Uterine findings detected on laparoscopy

18 women had uterine pathology. 15 women had fibroid, one had arcuate uterus and one had bicornuate uterus

Uterine Findings	Count
NORMAL	77
FIBROID	15
BULKY UTERUS	1
ARCUATE UTERUS	1
BICORNUATE UTERUS	1
Total	**95**

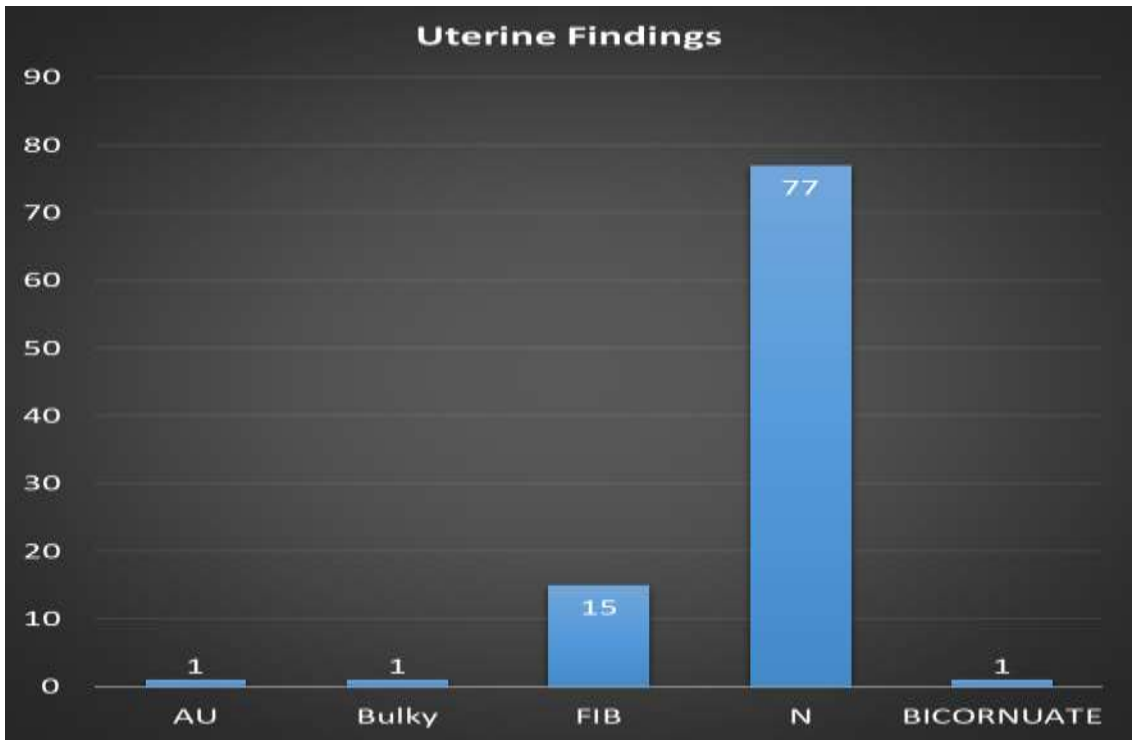


Table 13: Ovarian findings

- 70 women had ovarian pathology.
- 34 women had polycystic ovaries.
- 15 women had chocolate cyst of ovary.
- 13 women had ovarian cysts.

OVARIAN FINDINGS	Count
NORMAL	25
PCO	33
DERMOID CYST	1
CHOCLATE CYST	15
OVARIAN CYST	13
HAEMORRHAGIC CYST	6
PCO – HC	1
UN RUPTURED LF	1
Total	**95**

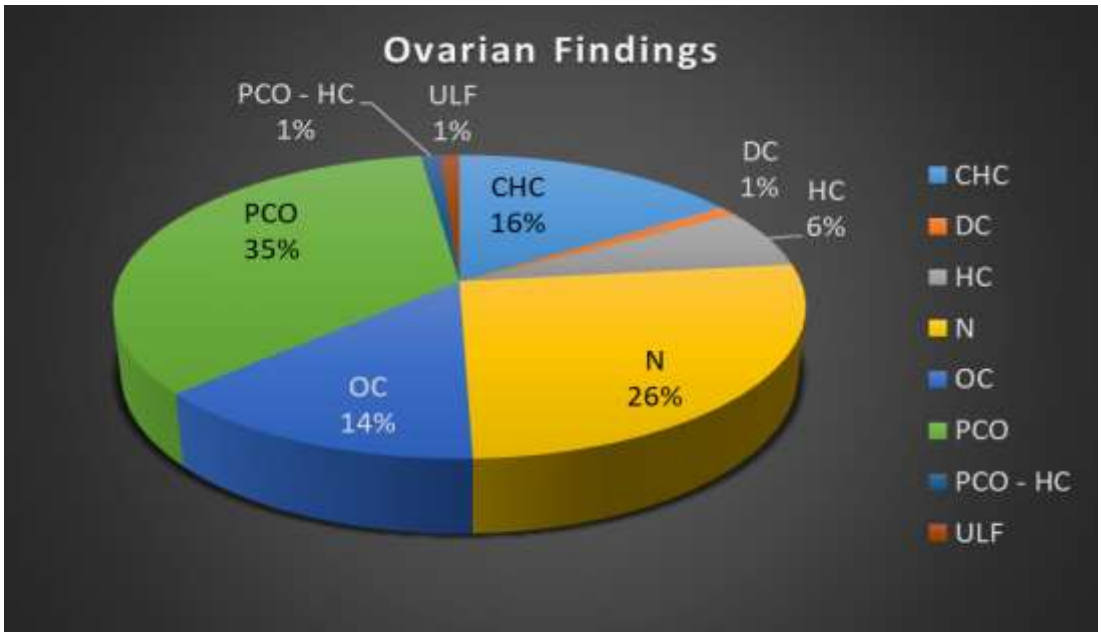


Table 14 : Findings in pouch of Douglas

6 women had endometrial deposits in the pouch of douglas.

POD is obliterated in 2 women

Findings in POD	Count
OB	2
END	6
Normal	87

Table 15: Fallopian Tube findings

- 17 women had tubal pathology diagnosed on laparoscopy.
- 11 women had tubal blocks diagnosed on chromo pertubation.
- Among them 9 had cornual block and 2 had ampullary block.
- 5 women had hydrosalphinx .
- One woman with bilateral hydrosalphinx turned out to have tubercular salphingitis on histopathology.
- One women has absent right tube which was consistent with history of previous ruptured ectopic pregnancy

Findings of TUBES	Count
Blocked tubes	11
Absent Tube	1
Hydrosalphinx	5
Normal	78

Block Type	Count
Right tubal block	5
Left tubal block	4
B/L tubal block	2

HSG Vs Laparoscopy:

- ❖ Out of 6 women who had B/L tubal blockade on HSG
- ❖ Only 1 women had B/L tubal blockade on LAPAROSCOPY
- ❖ The other 5 found to have normal tubes
- ❖ Hence tubal pathology was better picked up by laparoscopy which was statistically significant
- ❖ HSG can pick up only the anatomical abnormality but laparoscopy can pick up physiological and anatomical tubal pathology also

Table 16 : Endometriosis

Endometriosis Type	Count
Chocolate Cyst	15
Endometric Deposits	6

- 21 women had endometriosis.
- 15 had chocolate cysts and another 6 had endometriotic deposits in the pelvis

Table 17 : Adhesions

Adhesions Type	Count
Flimsy adhesions	6
Dense adhesions	2
Peri hepatic	2
Peri tubal	7

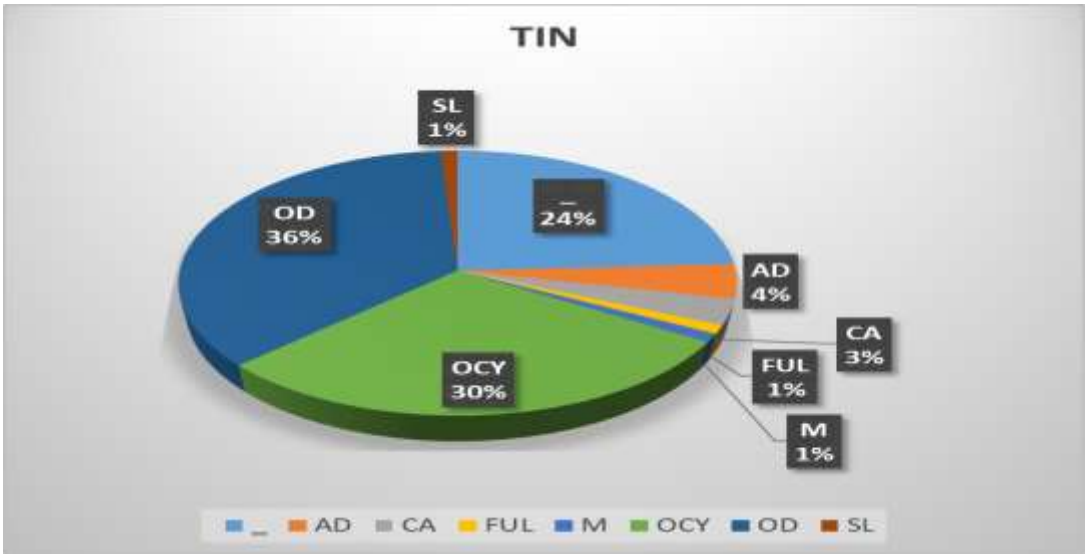
21 women had pelvic adhesions and 2 women had perihepatic adhesions.

Table 18 : Age Wise Distribution Of Reproductive Pathology

Age in Yrs (%)	Uterine pathology	PCOD	Ovarian cyst	Tubal pathology	Endometriosis	Adhesions	Normal study
20-30	9	24	24	12	10	12	8
30-40	9	10	11	5	2	5	2

Table 19: Concurrent therapeutic interventions

THERAPEUTIC INTERVENTION	Count
Nil intervention	23
Adhesiolysis alone	4
Cyst aspiration	3
Fulgration	1
Myomectomy	1
Ovarian cystectomy	28
Ovarian drilling	34
Salphingectomy	1
Total	**95**



Therapeutic intervention was done in 72 women (75.7 %) in addition to diagnostic laparoscopy.

- Majority underwent ovarian drilling (34/72) i.e. 47%
- Ovarian cystectomy done in (28/72) 38%
- Adhesiolysis alone in 5%
- Adhesiolysis with other procedures done in 16%

INTRA-OP COMPLICATIONS

In two cases there was difficulty in creating the pneumo peritoneum otherwise no intraoperative complications were encountered.

POST OPERATIVE COMPLICATONS

None of the women in the study had post-operative complications.

Follow up

20 women conceived during the period of study. Among these 17 women had under gone concurrent therapeutic interventions.

Table 20: Conception Rate in relation to therapeutic intervention

Conceived	Count	Success Rate
Therapeutic intervention	17 (72)	23.6
Non - intervention	3 (23)	13

- **23.6% of the women who underwent therapeutic intervention at laparoscopy conceived during follow up.**

- 3 women - conceived spontaneously after LAPAROSCOPIC OVARIAN DRILLING
- 4 women conceived with ovulation induction in subsequent cycles after ovarian drilling
- 1 woman who had polycystic ovaries And adhesions had undergone ovarian drilling and adhesiolysis conceived
- 1 woman having endometriosis conceived with Tab. Dinogest.
- 1 woman conceived after adhesiolysis alone.
- 2 women underwent chocolate cyst excision and treated with Dinogest and concieved
- 3 women conceived after Cystectomy (out of which 2 conceived after ovulation induction)
- 1 woman in whom myomectomy done conceived.
- 1 woman with unilateral tubal block conceived after Inj. placentrex in subsequent cycles.

Table 21: Duration from laparoscopy to conception

Duration of laparoscopy	Count
<3	6
3 to 6	4
6 to 9	9
9 to 12	1

10 women conceived within six months of laparoscopy.

Discussion

- Diagnostic laparoscopy is now recognized as a basic skill which should be learnt by all gynaecologists. It is an essential part of the complete evaluation of the infertile couple. Direct visualization of the abdominal and pelvic organs allows definitive diagnosis to be made where clinical evaluation and imaging techniques have failed or equivocal.
- It provides information regarding the uterine, ovarian pathology, tubal status and pelvic adhesions, biopsy specimen for histological confirmation and has replaced certain old procedures like gas insufflations and even HSG in assessing the tubal patency.
- With advances in imaging techniques such as high resolution Transvaginal sonography, 3D ultrasound, saline infusion sonography, HSG, need of laparoscopy for diagnosis of infertility is reduced. However in the same sitting diagnostic laparoscopy can be converted into therapeutic procedure thus offering definitive management for the infertile couple.
- This unique advantage of laparoscopy was considered and a cross sectional study was conducted.

Authors	Year	Mean Age (Yrs)
Usmani AT61	1995	22.1
Waseem Talib et al62	2003	27.4
Present study	2015	28.6

The mean age of the women in the study was 28.6 yrs which is comparable to study by Waseem Talib et al.

Authors	**Year**	**Mean Duration of Infertility (Yrs)**
Gokhan Goynumer 13	2008	2.6
Talt Naz 63	2009	6.9
Present study	2015	5.2

The mean duration of infertility is 5.2 yrs which differs from the study, done by Gokhan Goynumer et al 13 where the mean was 2.6 yrs among women with infertility. This increase in the present study could be due to many reasons like non affordability, accessibility to the hospital, awareness, socioeconomic status etc leading to late evaluation of the infertile couple.

Authors	**Year**	**Irregular cycles (%)**
Waseem Talib et al62	2003	20
Present study	2015	53

In the present study 53% women had irregular cycles and 47 had regular cycles.

However in the study by Waseem et al 20% women had irregular cycles though 48%had polycystic ovaries detected on laparoscopy, 28% had regular cycles but had polycystic ovaries. In present study 53% had irregular cycles and 43% had polycystic ovaries. In the present study Anovulatory infertility (43%) is the most common cause of infertility.

Authors	**Symptomatic Women (%)**
Talat Naz63	22.27
Present study	29

29 women had symptoms like pelvic pain,dysmenorrhea and dyspareunia. Of the symptomatic women 14 had endometriosis and 7 asymptomatic women had endometriosis. Of the 29 symptomatic women, 7 had polycystic ovaries, 4 had adhesions 2 had normal study and another 2 had bilateral hydrosalphinx.

Authors	**Year**	**Normal USG(%)**
Talat Naz63	2009	82.35
Present study	2015	61

Ultrasonography of the pelvis is the basic part of evaluation of the infertile women and ithas replaced routine invasive investigations. In half of the patients ultrasonography was normal. Ovarian pathology including polycystic ovaries, simple cysts, adnexal masses, and fibroid reported on ultrasonography were confirmed on laparoscopy. In the present study ultrasonography has detected pelvic pathology in forty nine women. Where as in the study by Talat Naz63 pelvic pathology was found in 17.65% of the women by ultrasound which was confirmed on laparoscopy.

6 women had raised serum prolactin and 2 women with galactorrhea had raised serum prolactin.
Major causes of infertility include ovulatory dysfunction (56%), tubal and peritoneal pathology (30-40%), and male factors (30-40%). Uterine pathology is generally uncommon, and the rest is largely unexplained.

Cause	**Percentage**
Anovulatory infertility	56
Tubal factors	17.8
Pelvic adhesions	18
Endometriosis	22

In the present study anovulatory infertility is the common cause of infertility, the other factors like tubal and peritoneal factors are comparable to the literature. In the present study Anovulatory infertility (43%) is the most common cause of infertility, which is comparable to the study by Elsir A Elussein et al**[63]** where anovulation contributed to infertility in 60.3% of the women.

Diagnostic laparoscopy alone can provide information regarding the uterine pathology, ovarian and tubal pathology and can point out the site of tubal obstruction.

87.4 % of the women in the study had pelvic pathology noted on laparoscopy.

Authors	**Year**	**Pelvic Pathology (%)**
Gary P.Wood4	1983	56
Abdulrahman W. ElYahia	1994	57.7
Talat Naz63	2009	51.47
Present study	2015	87.4

In the study, Laparoscopic Evaluation of Apparently Normal Infertile Women by Abdulrahman W. El-Yahia 18 57.7 % of the women had pelvic pathology detected by laparoscopy .In our study in 87.4 % of the women reproductive pathology was noted. In 33% of the women, laparoscopy freshly detected reproductive pathology which was missed by other modalities like clinical examination and USG. So, even normal infertile women have reproductive pathology to a significant level though it is less in our study compared to other studies.

15 % women had myoma of the uterus in the present study whereas in the study done byTalt Naz et al**[44]** the incidence of fibroid detected at laparoscopy on women with infertility was 2.2%.

Authors	**Year**	**Polycystic Ovaries**
Waseem Talib et al45	2008	48
Talt Naz 44	2009	8.82
Present study	2015	34

In the study conducted by Talt Naz ovarian pathology was seen in 13.23% of infertility. Among these PCO was found in 8.82% of infertility. In the present study ovarian pathology was seen in 56% of the women and among this 34% of the women had polycystic ovaries which is comparable to the study by Waseem Talib et al**[45].**

In present study anovulatory infertility is common.

Only 5 women with polycystic ovaries had raised LH. Rest had eugonadotropic anovulatory infertility.

Authors	**Year**	**Bilateral tubal block(%)**	**Unilateral tubal block(%)**
Waseem Talib et al62	2003	24	12
Talt Naz 63	2009	23.52	2.94
Present study	2015	2	9

17 % of the women had tubal abnormalities detected on laparoscopy which correlates with the literature that tubal factors account for 15- 30 % of infertility. 5 women had hydrosalphinx, 11 women had tubal blockade among them 2 had bilateral tubal blockade. 2 women had cornual blocks with no free flow of the dye even on repeated flushing.

Authors	**Year**	**Pelvic Adhesions(%)**
Peterson&Behrman 29	1970	20
Talt Naz 43	2009	25
Present study	2015	21

Pelvic inflammatory disease resulting in adhesions was seen in 18 % of the women which is comparable with the study by Peterson & Behrman. 4 women had adhesions in pouch of douglas, 7 women had peritubal adhesions. Pelvic tuberculosis was found in 1 woman on histopathology.

Chocolate cysts were seen in 13 women and another six had endometriotic deposits

Authors	**Year**	**Endometriosis(%)**
Peterson&Behrman **29**	1970	33
Mehmood **46**	2003	16.16
Talt Naz **43**	2009	10.29

Present study	2015	22.1

In the study by Talat Naz the incidence of endometriosis was 10.29 % in women with infertility. However prevalence of endometriosis among infertile women was 16.16% in the study by Mehmood.

In asymptomatic women the prevalence of endometriosis ranges from 3% to 43%.This great variation in prevalence is explained by various factors like study population, age, socioeconomic status. Also, the study of infertile or chronically symptomatic women would increase the probability of finding endometriosis at surgery. Other factors that can influence the observed prevalence of disease in clinical studies include the investigator's level of interest in and knowledge of the disease, the referral of patients to well known medical centers, and differences in available medical care, local health priorities, and reasons for seeking medical care.

Factor	**Number /Percentage n = 100**
PCO & Tubal block	4
Adhesions & tubal block	3
Hydrosalphinx ,adhesions &tubal block	3
Endometriosis & tubal block	3

As depicted in the table adhesions and tubal blocks resulting from PID are seen in combination.

Therapeutic intervention was done in 72 women in the same setting.

Intervention	**Waseem Talib et al62(%)**	**Present study**
Ovarian drilling	56	34
Adhesiolysis	52	10
Cystectomy	-	28
Salpingostomy	16	-
Cauterization of endometriosis	28	4

Common therapeutic interventions made are ovarian drilling (34), adhesiolysis, (10) cystectomy ant cyst puncture.(28)

Clinical outcome of Laparoscopic ovarian diathermy in PCOS patients

A very rapid response has been reported following LOD in several studies, with ovulation occurring within 2-4 weeks and menstruation within 4-6 weeks in the responders .Restoration of regular ovulatory cycles occur in about two-thirds of cases.

Recently , in a large randomised controlled trial involving 168 clomophene citrate resistant PCOS women,Bayaram and co –workers 67 reported an ovulation rate of 70%per cycle and cumulative conception and live birth rates of 76% and 64% respectively,following LOD.

In the study by Waseem Talib et al 62 common procedures performed laparoscopically inprimary infertility were laparoscopic ovarian diathermy 56%, adhesiolysis 52%,cauterization of endometriotic spots 28%, and salpnigostomy 16%. Therapeuticintervention are based on the reproductive pathology detected on laparoscopy.

Thus laparoscopy offers both diagnostic and therapeutic advantage to the infertile women.

In the present study there were no complications associated with laparoscopy, however there was difficulty in creating the pneumoperitoneum in two patients.

Incidence of complications associated with laparoscopy in 276 patients,in the study by Peterson & Behrman**[29]** is shown in the table.

Complication	**Peterson & Behrman6 (Number)**	**Present study**
Gastric perforation	1	-
Wound infection	3	-
Wound hematoma	3	-
Failed pneumoperitoneum	12	2

In the study, An audit of diagnostic laparoscopies for infertility by Mehmood S(2003),twenty eight patients (8.29%) showed minor problems like shoulder tip p ain, abdominal distension, vomiting and fever, following laparoscopy**[46]**

So though laparoscopy is invasive procedure, in the hands of well-trained surgeon andhis team the complications can be minimized. There is an urgent need to incorporate hands on training as a part of post graduate training.

Successful outcome

20 women conceived during the follow up. 23.14 %(17/72) of the women who underwent therapeutic intervention at laparoscopy conceived during follow up.

So pregnancy rate is more between 20 -30 yrs and in the women who underwent therapeutic intervention at laparoscopy which justifies the role of laparoscopy with its added therapeutic intervention in the evaluation of infertile women.

50% (10/20) of the women conceived in less than six months of laparoscopy.

Result

The mean age of women in the study was 28.6 yrs.The mean duration of infertility was 5.2 yrs. In 82.4% of the women pelvic pathology was noted on laparoscopy. Among these 33% of the women had undiagnosed pathology detected on laparoscopy. The pathology detected was polycystic ovaries (35.7%),tubal pathology(17.8%), tubal block(11.5%),pelvic adhesions(22.1%) endometriosis(22.1%). Therapeutic intervention was done in 75.7% of the women.

There was difficulty in creating pneumo peritoneum in 2 women. None of the women had intra operative or post operative complications.20 women conceived during the period of study.

Summary

- The study "THE ROLE OF LAPARSCOPY IN THE MANAGEMENT OF INFERTILITY PATIENTS" was done to know the prevalence of reproductive pathology in infertility patients and to formulate the line of management in such patients.
- 95 women with infertility were included in the study and subjected to laparoscopy under general anaesthesia after preliminary work up for infertility.
- The mean age in the study was 28.6 yr.
- The mean duration of infertility was 5.2 yrs
- 29 women had symptoms like pelvic pain, dysmenorrhea and dyspareunia, of the 29 symptomatic women 14 had endometriosis.
- In 87.4% of the women reproductive pathology was noted on laparoscopy. Among these in 33.6% of the women reproductive pathology was freshly detected by laparoscopy which was missed by other modalities like clinical examination and USG.
- 15 % women had myoma of the uterus in the present study.
- Ovarian pathology was seen in 73% of the women and 35% of the women had polycystic ovaries.
- Eugonadotropic Anovulatory infertility is the most common cause of infertility in this study.
- 17.89 % of the women had tubal abnormalities detected on laparoscopy, 11 women had tubal blockage.
- Pelvic inflammatory disease resulting in adhesions was seen in 18 % of the women. 6 women had adhesions in pouch of douglas, 7 women had peritubaladhesions. Pelvic tuberculosis was found in 1 woman on histopathology.
- Chocolate cysts were seen in 15 women and another six had endometriotic deposits.
- Therapeutic intervention was done in 72 women in the same setting. Thus laparoscopy offered both diagnostic and therapeutic advantage to the infertile women.
- There was difficulty in creating pneumo peritoneum in 2 women
- None of the women had intra operative complications or post-operative complications.
- 20 women conceived during the period of study. 23.6% of the women who had under gone therapeutic intervention at laparoscopy conceived during follow up.

Conclusion

- ❖ Ovulatory disorders represent a major cause of infertility (43%).
- ❖ Tubal and peritoneal pathology is also responsible for infertility (28%) and diagnostic laparoscopy is needed for their identification.
- ❖ Laparoscopy detects pelvic pathology to a significant level even in women thought to be at low risk.
- ❖ Laparoscopy enables formulating the line of management for infertile women.
- ❖ Most effective treatment decisions and interventions can be made in the light of laparoscopic findings in managing infertility.
- ❖ Though laparoscopy is invasive the complications associated with the procedure can be minimized with proper training.
- ❖ Laparoscopy is a valuable technique for the complete assessment of female infertility, especially in symptomatic patients and should be used early inthe diagnostic work up.
- ❖ With bulk of our patients belonging to low socio-economic status laparoscopic evaluation of infertile women offers therapeutic advantage to the needy infertile couple.
- ❖ Laparoscopy has successfully shortened the duration of infertility and increased the conception rate in my study.
- ❖ Hence laparoscopy can be used as a gold standard in the diagnosis and management of infertility particularly among the women whose :

1. Age > 30 YRS
2. Duration of infertility > 5 yrs
3. PCODS patients who are Gnrh resistant and high serum LH
4. Unexplained female infertility.

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