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Original Research Article

Evaluation of cases of infertility by diagnostic laparoscopy

Sachin Wankhede, Sarika Thakare, Nivedita Goverdhan*, Santosh Shahane

Department of Obstetrics and Gynaecology, Indira Gandhi Government Medical College, Nagpur, Maharashtra, India

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***Correspondence:**

Dr. Nivedita Goverdhan,

E-mail: niveditagoverdhan@gmail.com

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ABSTRACT

Background: Infertility affects nearly 10-15% of couples and is an important part of clinical practice. Leading causes of infertility include tubal disease, ovulatory disorders, uterine or cervical factors, endometriosis and male factor infertility. The objective of the study was to find out different causes of female infertility with diagnostic laparoscopy.

Methods: This was a descriptive study conducted from February 2012 to November 2013. 115 patients with infertility attending the infertility clinic in OPD of Obstetrics and Gynaecology were evaluated clinically with detailed history. The necessary investigations were carried out and the laparoscopic findings were documented.

Results: There were 91 cases (79.13%) with primary infertility and 24 (20.87%) with secondary infertility. Laparoscopy revealed normal findings in 14 cases (15.38%) of primary infertility and 1 case (4.17%) of secondary infertility. Pelvic abnormality was found in 100 cases (86.95%). Tubal block was the most common pathology found in 36 cases (31.30%) followed by polycystic ovaries in 32 (27.83%) and adhesions in 24 (20.87%). Uterine anomalies were found in 3 cases (3.30%).

Conclusions: Diagnostic laparoscopy is a valuable technique and a mandatory investigation, which, though invasive, is more convenient and more precise for the diagnosis of infertility. Because of its potential diagnostic as well as therapeutic benefits, all patients with infertility should undergo diagnostic laparoscopy as part of their primary workup of infertility.

Keywords: Diagnostic laparoscopy, Infertility, Tubal block

INTRODUCTION

Infertility affects nearly 10-15% of couples and is an important part of clinical practice.¹ Leading causes of infertility include tubal disease, ovulatory disorders, uterine or cervical factors, endometriosis and male factor infertility. The female factor contributes most (i.e. 40-45%) to etiologies of infertility followed by male factor (32-40%), both partners (10%) and unexplained (10%).²

The appropriate selection of investigations based on problem areas identified by history and physical examination would guide the physician in the management of infertile couples. Diagnostic laparoscopy is not recommended as first line screening test. However, it should be considered in patients with a history suggestive of endometriosis, previous pelvic

inflammatory disease and previous pelvic surgery or in the absence of clinical signs and symptoms suggestive of diagnosis.³ Laparoscopy is an essential step and a standard procedure in the investigation and evaluation of infertile females before initiating infertility treatment.

The premier objective of this study includes diagnosing and treating the definitive cause of infertility and giving a realistic prognosis to the patient.

METHODS

This is a descriptive study, carried out in the Department of Obstetrics and Gynecology at Indira Gandhi Government Medical College and Hospital Nagpur, Maharashtra, India over a period of February 2012 to

November 2013 after obtaining institutional ethics committee approval. Patients with female factors of infertility attending the infertility clinic in OPD of Obstetrics and Gynaecology were selected and informed about the study and risk associated with it. Study subjects were evaluated clinically with detailed history. The necessary investigations were carried out and the laparoscopic findings were documented.

RESULTS

In this study the maximum number of cases 53 (46.09%) were in the age group 21-25 years. There were 91 (79.13%) cases of primary infertility and 24 cases (20.87%) of secondary infertility. Besides infertility, the most common associated complaint was dysmenorrhoea 27 cases (23.48%) followed by irregular menstrual cycles 17 cases (14.78%). There were 17 cases (14.78%) with past history of treated tuberculosis of which 12 cases had pulmonary tuberculosis and 5 cases were of genital tuberculosis. Most cases were with duration of 3-5 years of infertility.

Table 1: Distribution of study subject according to age, duration of infertility and BMI.

		Primary infertility	Secondary infertility
Age (years)	Range	20-37	24-35
	Mean	26.8	28.75
Duration of infertility (years)	Range	2-15	2-15
	Mean	5.16±2.63	5.15±2.92
BMI (kg/m ²)	Mean	22.3±2	23.18±3.28
Total number of patients		91	24

In the present study out of 115 cases ovarian abnormality was found 20 cases on ultrasound, which included polycystic ovaries and ovarian cyst, uterine abnormalities in 11 patients and hydrosalpinx in 1 patient.

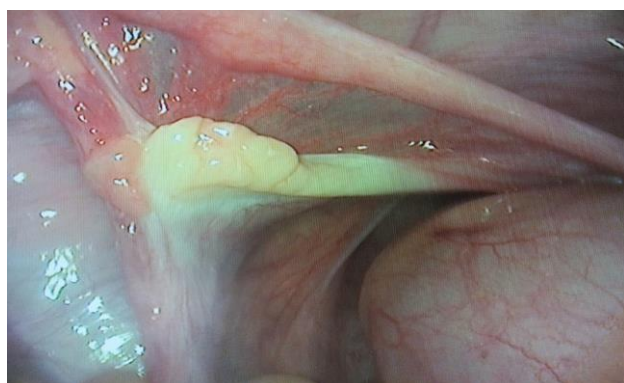


Figure 1: Streak ovary.

28 patients had uterine abnormalities on laparoscopy. Ovarian abnormality was seen in 53 (46.08%) cases on laparoscopy. Most common finding was polycystic

ovaries seen in 32 cases (27.83%). Ovarian cyst was seen in 11 (9.57%) patients.

Table 2: Distribution of study subjects according to ultrasonography and laparoscopic findings.

Abnormality detected	No. of patients	
	Ultrasonography	Laparoscopy
Uterine findings		
No abnormality	82 (71.30%)	87 (75.65%)
Fibroid	6 (5.22%)	6 (5.22%)
Small uterus	2 (1.74%)	8 (6.96%)
Bulky uterus	2 (1.74%)	11 (9.57%)
Unicornuate	0 (0%)	2 (1.74%)
Rudimentary uterus	1 (0.87%)	1 (0.87%)
Ovarian findings		
Normal ovaries	96 (83.47%)	62 (53.91%)
Polycystic ovaries	15 (13.04%)	32 (27.83%)
Ovarian cyst	4 (4.40%)	11 (9.57%)
Adherent ovaries	0 (0%)	6 (5.22%)
Streak ovaries	0 (0%)	2 (2.20%)
Tub-ovarian mass	0 (0%)	2 (2.20%)
Chocolate cyst	1 (0.87%)	0 (0%)
Tubal Findings		
Normal	114 (9.13%)	61 (53.04%)
Beaded	0 (0%)	19 (16.52%)
Hydrosalpinx	1 (0.87%)	19 (16.52%)
Adherent	0 (0%)	8 (6.96%)
Rudimentary	0 (0%)	3 (2.61%)
Unilateral absent tube	0 (0%)	1 (0.87%)
Tubal tubercles	0 (0%)	4 (4.40%)
Other laparoscopic findings		
Pelvic adhesions		24 (20.87%)
Endometriosis		10 (8.70%)
Free fluid in POD		24 (20.87%)



Figure 2: Bilateral polycystic ovaries.

Bilateral tubal block was present in 15 cases (13.04%). Unilateral tubal block was present in 21 cases (18.26%). In 79 cases (68.70%) tubes were patent. Findings

suggestive of tuberculosis of fallopian tubes like beaded tubes, hydrosalpinx, adherent tubes and tubal tubercles were noted in 50 cases (43.48%).

Table 3: Distribution of study subjects according to the operative procedure carried out during laparoscopy.

Operative procedure	No. of subjects	Percentage
Ovarian drilling	26	22.61
Adhesiolysis	9	7.83
Fulguration of endometriotic deposits	4	3.48
Ovarian cyst enucleation	3	2.61
Total	42	36.52

Pelvic adhesions were seen in 24 cases (20.87%), endometriosis in 10 cases (8.70%) and fluid in pouch of Douglas in 24 cases (20.87%) constituted other non-uterine, non-tubal findings on laparoscopy.

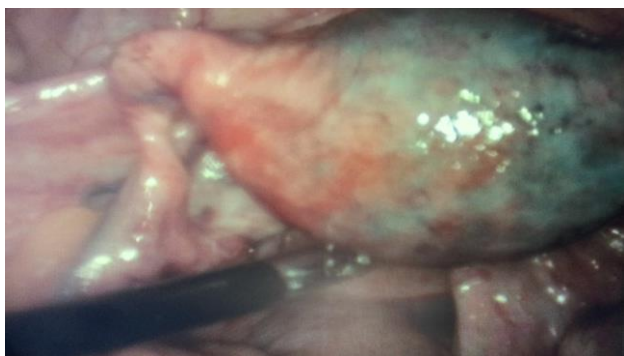


Figure 3: Extravasation of dye in cornual block.

Operative procedures were carried out in 42 cases out of 115, of which, ovarian drilling was the most common, done in 26 (22.61%) patients, followed by adhesiolysis, fulguration and ovarian cyst enucleation. Intraoperative

complications were minimal like bleeding in 3 cases (2.61%) which was controlled with electrocoagulation. Post-operative complications like vomiting and fever were encountered in 7 cases. There was no complication which required laparotomy.



Figure 4: Hydrosalpinx.

Most common mode of treatment advised in both primary and secondary infertility was ovulation induction (62.22% and 50% respectively) followed by AKT (12.22% and 25% respectively).

Adoption was advised in one case of primary infertility with rudimentary uterus.



Figure 5: Adhesions.

Table 4: Distribution of study subjects according to treatment advised after laparoscopy.

Treatment Advised	Primary		Secondary		Total	
	No.	%	No.	%	No.	%
Ovulation induction	56	62.22	12	50.00	68	59.65
AKT	11	12.22	6	25.00	17	14.91
IVF	12	13.33	4	16.67	16	14.04
Danazol	8	8.89	1	4.17	9	7.89
IUI	2	2.22	0	0.00	2	1.75
Septum removal	0	0.00	1	4.17	1	0.88
Myomectomy	1	1.11	0	0.00	1	0.88
Total	90	100.00	24	100	114	100.00



Figure 6: Uterine fibroid.

DISCUSSION

There are few subjects of late that have evoked more debates, discussions and disagreements in gynaecology than the evaluation and management of the infertile couple. Age is an important factor for the prediction of chances for spontaneous conception in both untreated patients and patients who are being treated for infertility. Fertility in women peaks between the ages of 20 and 24, decreases relatively little till the age of 30 and then declines progressively.⁴ In this study the maximum number 53 cases (46.09%) were in the age group 21-25 years. Similar findings were seen by Kanal P and Sharma S and Boricha Y et al, who quoted maximum cases of infertility (45%) in age group of 21-25 years and 42.85% in the age group of 21-25 years respectively.^{5,6}

Mehreen B et al revealed that maximum number of patients (45.71%) presented with 2-5 years of infertility, similar to present study.⁷ Less than 10 years duration of infertility did not significantly affect the conception rate in patients undergoing treatment for infertility; however duration longer than 10 years showed an exponential decrease in conception rates according to a study by Dechanet et al.⁸ Similar findings were reported by a study by Wilkes et al.⁹

Body Mass Index has a negative impact on infertility treatment programmes as described in studies by Imani et al and Wass et al with respect to the dose and the duration of ovarian stimulation protocols and the conception rates.^{10,11} Weight reduction has been described as the first best treatment of obese women. Weight loss reduces free androgen levels and improves ovulatory function, thereby increasing conception rates and probably decreasing miscarriage rates. Polycystic Ovary Syndrome (PCOS) is the most common cause of anovulation. It affects 4-7% of women of reproductive age and 61% of these women are overweight or obese.¹² Obesity also decreases the chances of spontaneous conception in ovulatory women.

Tuberculosis (TB) is a chronic infectious disease with a worldwide distribution, and the incidence is high in developing countries. Genital TB produces devastating effects by causing irreversible damage to the fallopian

tube resulting in infertility which is difficult to cure both by medical and surgical methods. Due to the asymptomatic nature and varied clinical presentation, clinical diagnosis of genital tuberculosis is difficult.¹³ Findings of fallopian tubes like beaded tubes, hydrosalpinx, adherent tubes and tubal tubercles are suggestive of genital tuberculosis. In this study, findings suggestive of genital tuberculosis were noted in 50 cases (43.48%). Similarly, Neeta S found that prevalence of genital tuberculosis in tubal factor infertility was 48.5% in her study.¹⁴ Shaheen et al found 7% of gynaecological OPD patients to be suffering from infertility and 2.3% of patients to have genital TB, and concluded that it is very essential for a Gynecologist, especially in TB endemic countries, to anticipate the possibility of genital TB in infertile patients.¹⁵

Previous studies in the field of genital TB have found a very strong association of genital TB with tubal infertility. Singh et al¹⁴ in their study stated that 82% cases with tubal factor infertility had history of prior treatment for tuberculosis and 28.5% showed evidence of extra genital tuberculosis. Sharma et al in their study of infertility found 34.1% cases with past history of pulmonary tuberculosis and 11.7% cases with history of extra pulmonary tuberculosis.¹⁶

The prevalence of polycystic ovarian disease in asymptomatic women is thought to be between 16 and 33% and in this study it was 27.83%.¹⁷ Raida M et al in their study found polycystic ovaries in 97.22% of primary and 97.3% of secondary infertility cases.¹⁸ Boricha Y et al in their study found polycystic ovaries to be the commonest ovarian factor in 50% cases followed by ovarian cyst.⁶ Tubal factor which accounts for 15-30% of infertility in all women is common in developing countries with high rate of PID but limited resources.¹⁹ Tubal blockage is found to be most common cause of infertility in India i.e. 42%.⁵ The results of this study were similar to Raida M et al which stated tubal factor was responsible for 16.53% of primary and 39.09% of secondary infertility with most cases were diagnosed to have bilateral tubal block.¹⁸ Otolorin EO et al in their study found tubal block in 44.95% of cases of which unilateral block in 6.6% and bilateral block in 35.5% cases.²⁰

Aflatoonian A et al, in their study, found endometriosis in 8% of cases of infertility in Iran.²¹ Yedidya H et al revealed adhesions in 30%.²² Otolorin EO et al in their study found endometriosis in 1.4% and adhesions in 55% of cases.²⁰ Adhesions found in high frequency suggest high incidence of sexually transmitted diseases in our locality. Farquhar C et al in their study stated that ovarian drilling is followed, at least temporarily, by a high rate of spontaneous ovulation and conception, or that subsequent medical ovulation induction becomes easier.²³ Mourali et al stated that laparoscopic ovarian drilling per case of polycystic ovary syndrome and after failure of induction with clomiphene citrate provides a

pregnancy rate of about 40%.²⁴ Abu H et al in their study found that laparoscopic ovarian drilling, whether unilateral or bilateral is a beneficial second-line treatment in infertile women with clomiphene citrate resistant PCOS.²⁵ It is as effective as gonadotrophin treatment but without the risk of multiple pregnancy or ovarian hyperstimulation and does not require intensive monitoring.

Hye Lee et al in their study found that 41.9% of women successfully conceived without assisted reproductive techniques or hormone treatment after surgery for endometriosis.²⁶

In current fertility practice, laparoscopy has traditionally been used as the final modality following HSG to examine the causes of infertility in the pelvic cavity, including endometriosis and tubal pathology. It has been reported that laparoscopy should be omitted in infertile patients suspected of unilateral tubal pathology.²⁷ In one study, the evaluation of fallopian tube at laparoscopy had a stronger impact on spontaneous fertility than the HSG results.²⁸ Bilateral tubal pathology diagnosed at laparoscopy affected prospects of spontaneous fertility, whereas unilateral tubal pathology affected prospects of spontaneous fertility less severely.²⁹ Bilateral tubal pathology is a given indication for ART, whereas unilateral tubal pathology is not a given indication for ART. Thus, the management plan of patients changes after laparoscopy.

CONCLUSION

Diagnostic laparoscopy is a valuable technique and a mandatory investigation which, though invasive, is more convenient and more precise for the diagnosis of female infertility. Indeed, diagnostic laparoscopy is the gold standard of diagnosis of tubal pathology, peritoneal factors, endometriosis and intra-abdominal causes of infertility. Not only does this help in identification of unsuspected pelvic abnormality but also contributes to treatment and decision making of infertility especially where assisted reproductive techniques are not freely available. Therefore because of its potential diagnostic as well as therapeutic benefits, all patients with infertility should undergo diagnostic laparoscopy as part of their primary workup of infertility.

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REFERENCES

1. Mosher WD, Pratt WF. Fecundity and infertility in the United States: incidence and trends. *Fertil Steril.* 1991;56(2):192-3.

2. Padubidri VG, Shirish DN. The Pathology of conception. In: Shaw's Text book of Gynaecology. 12th ed. New Delhi: BI Churchill Livingstone; 1983:154-68.
3. LuEsley D, Baker P. Female infertility. In: *Obstetrics and Gynecology- An evidence based text for MRCOG.* 1st ed. India; 2004:566-573.
4. Maroulis G. Effect of aging on fertility and pregnancy. *Seminars Reproduct Endocrinol.* 1991;9:165.
5. Kanal P, Sharma S. Study of primary infertility in females by diagnostic laparoscopy. *Internet J Med Update.* 2006;1(2):7-9.
6. Boricha Y, Sharma R, Boricha B, Sabrina M, Archana C, Narshetty J. Laparoscopy in 50 infertile couples: prospective study. *Int J Med Clin Res.* 2011;2(2):63-6.
7. Mehreen B, Batool WS, Khawaja Tahir KM. Diagnostic significance of laparoscopy in infertility and identification of various unsuspected factors associated with infertility in females. *J Pharm Sci. Res.* 2010;2(8):499-505.
8. Dechanet C, Belaisch-Allart J, Hédon B. Prognosis criteria for the management of the infertile couple, *J Gynecol Obstet Biol Reprod.* 2010;39(8 Suppl 2):S9-26.
9. Wilkes S, Chinn DJ, Murdoch A, Rubin G. Epidemiology and management of infertility: a population-based study in UK primary care. *Fam Pract.* 2009;26(4):269-74.
10. Imani B, Eijkemans M, Velde E, Habbema J, Fauser B. Predictors of patients remaining anovulatory during clomiphene citrate induction of ovulation in normogonadotropicoligoamenorrhic infertility. *J Clin Endocrinol Metab.* 1998;83:2361.
11. Wass P, Waldenstrom U, Rossner S, Hellberg D. An android body fat distribution in females impairs the pregnancy rate of in-vitro fertilization-embryo transfer. *Hum Reprod.* 1997;12(9):2057-60.
12. Pasquali R, Gambineri A, Pagotto U. The impact of obesity on reproduction in women with polycystic ovary syndrome. *Int J Obst Gynecol.* 2006;113:1148-59.
13. Goldin A, Baker W. Tuberculosis of the female genital tract. *J Ky Med Assoc.* 1985;83:75-6.
14. Singh N, Gurunath S, Suneeta M. Genital tuberculosis a leading cause of infertility in women seeking assisted conception in North India. *Archives Gynecol Obstet.* 2008;278(4):325-7.
15. Shaheen R, Subhan F, Tahir F. Epidemiology of genital tuberculosis in infertile population. *J Pak Med Assoc.* 2006;56(7):306-9.
16. Sharma J, Roy K, Pushparaj M, Kumar S, Mittal S. Laparoscopic findings in female genital tuberculosis. *Archives Gynecol Obstet.* 2008;278(4):359-64.
17. McVeigh E. Polycystic ovarian syndrome. In: Baker P, Leusley D eds. *Obstetrics and Gynaecology: an evidencebased text for MRCOG.* London: Oxford University Press; 2004:588-593.
18. Raida M, Al-Wazzan, Entessar A. Diagnostic laparoscopy in female infertility. *Ann Coll Med.* 2009; 35(1):58-64.
19. Hoffman L, Chan K, Smith B, Okolo S. The value of saline salpingosonography as a surrogate test of tubal patency in a low resource setting. *Int J Fertil women Med.* 2005;50:135-9.

20. Otolorin EO, Ojengbede O, Falase AO. Laparoscopic evaluation of the tuboperitoneal factor in infertile Nigerian women. *Int J Gynaecol Obstet.* 1987;25(1):47-52.
21. Aflatoonian A, Hassani S, Tabibnejad N. The epidemiological and etiologiical aspects of infertility in Yazd province of Iran. *Iranian J Reprod Med.* 2009;7:117-2.
22. Yedidya H, Eliezer H, Miriam A, Chaim Y. Diagnostic laparoscopy in primary and secondary infertility. *J Assist Reprod Genetics.* 1998;15(9):535-7.
23. Farquhar C, Brown J, Marjoribanks J. Laparoscopic drilling by diathermy or laser for ovulation induction in anovulatory polycystic ovary syndrome. *Cochrane Database of Systematic Reviews.* 2012 Jun;13(6):CD001122.
24. Mourali M, Kawali A, Fitouhi L, Bakri P, Hmila F, Binous N, et al. Ovarian drilling in treatment of infertility with dystrophic ovaries. *Medicale Tunisia.* 2012;90(2):122-8.
25. Abu H, Al-Inany H, De Vos M, Tournaye H. Laparoscopic ovarian drilling for treatment of PCOS. *Arch Gynecol Obstet.* 2013;288(2):409-22.
26. Lee H, Lee J, Choi Y. Natural conception rate following laparoscopic surgery in infertile women with endometriosis. *Clin Exp Reprod Med.* 2013; 40(1):29-32.
27. Lavy Y, Lev-Sagie A, Holtzer H, Revel A, Hurwitz A. Should laparoscopy be a mandatory component of the infertility evaluation in infertile women with normal hysterosalpingogram or suspected unilateral distal tubal pathology? *Eur J Obstet Gynaecol Reprod Biol. Eur J Obstet Gynecol Reprod Biol.* 2004;114(1):64-8.
28. Mol B, Collins J, Burrow E, Veen F, Bossuyt. Comparison of hysterosalpingography and laparoscopy in predicting fertility outcome. *Hum Reprod.* 1999;14:1237-42.
29. Nordenskjold F, Ahlgren M. Laparoscopy in female infertility. *Acta Obstetricaet Gynecologica Scandinavica.* 1983;62(6):609-15.

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