Print ISSN: 2321-6379
Online ISSN: 2321-595X

Original Article

Laproscopic Findings in Patients with Normal Hysterosalpingography (HSG) Findings and Unexplained Infertility

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Abstract

Introduction: Infertility is a disease of male or female reproductive system defined by the failure to achieve pregnancy within 12 months or more of regular unprotected sexual intercourse. The frequency varies from 5% to 15% in different communities that are approximately one in ten couples (about 80–90 million of the world population). It has been estimated that the diagnostic laparoscopy helps in finding the infertility factor in 21–68% cases of unexplained infertility as seen in different studies.

Materials and Methods: The present study was conducted in the Department of Obstetrics and Gynecology of Lalla Ded Hospital, GMC Srinagar, J and K, a tertiary care center, for 24 months from June 2018 to June 2020. A total of 64 cases of primary and secondary infertility were studied to know the role of diagnostic laparoscopy in the evaluation of infertility. The percentage of patients with primary infertility was higher (71.88%) as compared to patients with secondary infertility (28.12%).

Results: The results of the present study showed that the mean duration of primary infertility and mean age was 4.424 years and 30.23 years, respectively, while as in cases of patients with secondary infertility, the mean duration of infertility and mean age was calculated as 5.722 years and 32.889 years, respectively. In the present study on 64 patients, the normal laparoscopic findings were seen in 22 patients (34%) and abnormal findings were discovered in 44 patients (66%). The most frequent laparoscopic finding in present study was endometriosis seen in 22 (34%) patients, the frequency of pelvic adhesions was 14.1% with more number of patients with secondary infertility. Tubal factors (tubal blockade and hydrosalpinx) were less prevalent causes of infertility in the present study constituting 7.8% and 4.7%, uterine myomas were seen in 4.7%, and all in cases of primary infertility. Therapeutic intervention (adhesionolysis, drilling of cysts, and myomectomy) was done in 22% of patients.

Conclusion: From the present study, we concluded that diagnostic laparoscopy is the gold standard tool in the evaluation of female infertility.

Key words: HSG, IVF, IU

INTRODUCTION

Infertility is a disease of male or female reproductive system defined by the failure to achieve pregnancy within 12 months or more of regular unprotected sexual intercourse. However, it holds true for a female with age <35 years.[1] In women more than 35 years of age, infertility workup should begin after 6 months only. It may be primary or secondary. The primary infertility refers to couple who have never conceived. Secondary infertility indicates previous pregnancy irrespective of the outcome (abortion or live birth) but failure to conceive subsequently.[2] Infertility is a global problem. The frequency varies from 5% to 15% in different communities that are approximately one in ten couples (about 80–90 million of the world population). In India, the frequency of infertility is also more than 10% with a whooping 20 million population as infertile.[3]

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www.ijss-sn.com

Month of Submission : 06-2022
Month of Peer Review : 07-2022
Month of Acceptance : 08-2022
Month of Publishing : 08-2022

The causes of infertility with relative prevalence are as following:[4]

- Male factor – 17–28%
- Both male and female factors – 8–39%
- Female factor – 33–40%

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- Unexplained – 8–28%

Approximately 10–30% of couples are diagnosed with unexplained infertility, in which basic infertility ovulation reveals normal semen parameters, evidence of ovulation, patent fallopian tubes, and no other cause of infertility.[5] Patients with unexplained infertility may feel.

Reassured that even after 12 months of attempting, 20% will conceive in the following 12 months and 50% in following 36 months.[6] It is the diagnosis of exclusion. The variability in incidence is dependent on depth of investigation protocol extended to the couple. In Kashmir, the incidence is estimated to be 15% approximately.[7] Proposed mechanisms for unexplained infertility are as follows:

1. Luteinized unruptured follicle syndrome: It is thought to occur in 25% of patients with unexplained infertility. The condition involves luteinizing of follicle that has failed to rupture and releases its oocyte, leading to a normal menstrual cycle.[8]
2. Immunological factors: Anti-sperm antibodies and imbalance in T lymphocyte population.[9]
3. Infection: *Chlamydia tracohomatis*, *Ureaplasma urealyticum*, and *Mycoplasma genitlium*.[10]
4. Undiagnosed pelvic pathology: Peri-tubal adhesions and endometriosis.[11]
5. Occult male or oocyte factors: Impaired sperm DNA integrity and premature zona hardening (oocyte factor).[12]

In the present era, laparoscopy is the main tool in the armamentarium of infertility workup, which serves as both diagnostic and therapeutic modality. In cases of unexplained infertility after evaluation of both the partners, it helps to recognize endometriosis, pelvic adhesions, hydrosalpinx, and other peritoneal factors. It is particularly cost effective in the young couples as compared to fertility therapy. It has been estimated that the diagnostic laparoscopy helps in finding the infertility factor in 21–68% cases of unexplained infertility as seen in different studies. The benefit of laparoscopy is that some therapeutic procedures for infertility can be done at the same setting such as adhesionolysis, drilling of polycystic ovaries, and tubal nich surgeries. Laparoscopy also helps in devising the future management depending on the cause like whether to go for IUI or IVF.

Aims and Objectives

The study was accomplished to attain the subsequent objectives:

1. To investigate the role of Laparoscopy as diagnostic tool in unexplained infertility and normal Hysterosalpingography findings.
2. To study different pelvic causes of unexplained infertility.
3. To bring out possible interventions where ever required.

MATERIALS AND METHODS

The present study was conducted in the Department of Obstetrics and Gynecology of Lalla Ded Hospital, GMC Srinagar, J and K, a tertiary care center, for 24 months from June 2018 to June 2020. A total of 64 cases of primary and secondary infertility were studied. After taking detailed history, clinical examination, investigations, and proper written consent, patients were taken up for diagnostic laparoscopy post menstrually in proliferative phase of the menstrual cycle.

Inclusion Criteria

The following criteria were included in the study:

- Patients with unexplained infertility in reproductive age group.
- Patients with history of primary as well as secondary infertility.
- Patients having normal hysterosalpingography findings.

Exclusion Criteria

The following criteria were excluded from the study:

- Patients with documented anomalies of reproductive tract on HSG (Hysterosalpingography).
- Patients having any contraindication to laparoscopic procedures such as previous major surgeries, peritonitis, hernia, or large pelvic mass.
- Patients having contraindication to general anesthesia.
- Major male infertility.

Procedure

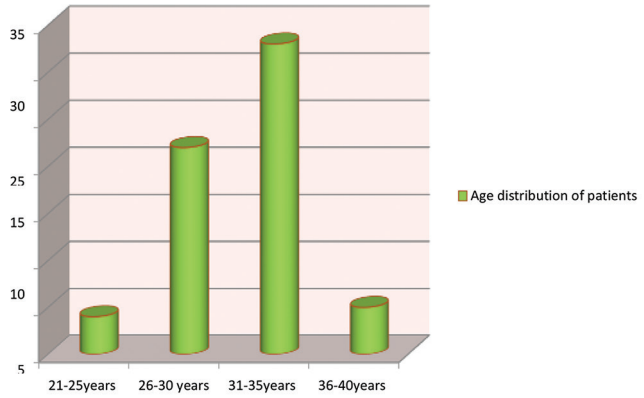
After clinical examination, diagnostic laparoscopy was performed to identify any possible pelvic pathology. A small incision in infra-umbilical region was made. Veres needle introduced and pneumoperitoneum created with 2–3 L of CO_2 at the rate of 1 L per minute. Then, trocar and cannula were inserted, after elevating the abdominal wall. Laparoscope was inserted, after removing the trocar. Then, the fibro-optic light cable was connected to the laparoscope and the light source. The camera was also connected to the laparoscope. The uterine manipulator was used to elevate the uterus especially in retroverted uterus and to mobilize the adnexa.

The systematic view of the pelvis was undertaken, commencing from the uterus. The fundus, anterior surface, and posterior surface of uterus was assessed. The fluid in pouch of douglas and any evidence of scarringa and endometriosis was identified. Each uterosacral ligament was looked for endometriosis scarring and each adnexa was thoroughly visualized. The anterior surface of both ovaries and fallopian tubes was inspected. The inferior surface of the ovary and

posterior leaf of the broad ligament up to uterosacral ligament were evaluated. The fallopian tubes were examined from its distal to proximal segment, and any evidence of distal tubal occlusion (hydrosalpinx) fimbrial phimosis was assessed.

RESULTS

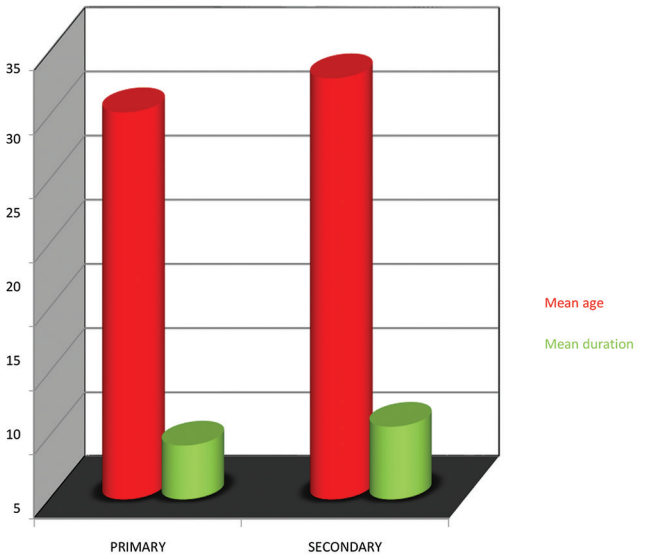
- Out of total 64 patients, the percentage of patients with the primary infertility was 71.88%, while as the percentage of patients with secondary infertility was 28.12%.
- Approximately half (51.5%) of the patients were in the age group of 31–35 years.

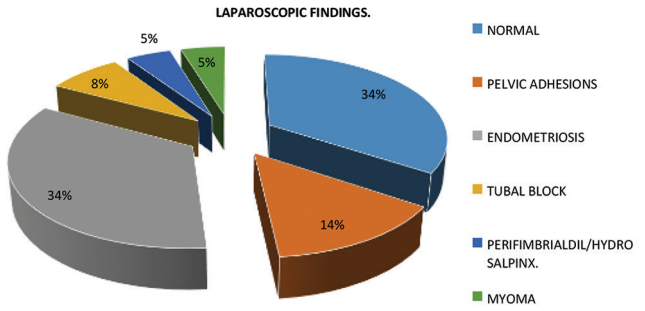


Duration of infertility (in years)			
S. NO	**Duration (Years)**	**No.**	**% Age**
1.	<or=03	16	25
2.	04–06	42	65.6
3.	>06	06	9.3

- The duration of infertility in 16 patients (25% of total patients) was approximately of 3 years, while in 42 patients (65.6), the duration of infertility under evaluation was of 4–6 years, and in 6 (9.3 %) patients, it was of more than 6 years.
- The mean duration of the primary infertility (total 46 patients) and mean age was 4.4 years and 30.2 years respectively, while as in cases of patients with secondary infertility, the mean duration of infertility and mean age was calculated as 5.7 years and 32.8 years, respectively. The mean age in primary and secondary infertility had statistically significant relationship with each other, while as the durations of infertility between two has no statistical significance.

Out of 64 patients, the laparoscopic finding in 22 (34.4%) patients was normal, 09 (14.1%) patients showed pelvic adhesions, 05 (7.8%) patients had tubal block on laparoscopy, perifimbrial dilatation/hydrosalpinx and uterine myoma was seen in 03 (4.7%) patients each, and 22 (34.4%) patients had endometriosis as laparoscopic findings.





Ta ble 1: Showing frequency of laparoscopic findings

S. No.	Laparoscopic findings	Frequency	Percentage	Cumulative Percentage
01.	Normal	22	34.4	34.4
02.	Pelvicadhesions	09	14.1	48.5
03.	Endometriosis	22	34.4	82.9
04.	Tubalblock	05	7.8	90.7
05.	Perifimbrial Dilatation/ Hydrosalpinx	03	4.7	95.4
06.	Uterine Myoma	03	4.7	100

Table 2: Showing relation of laparoscopic findings with infertility type

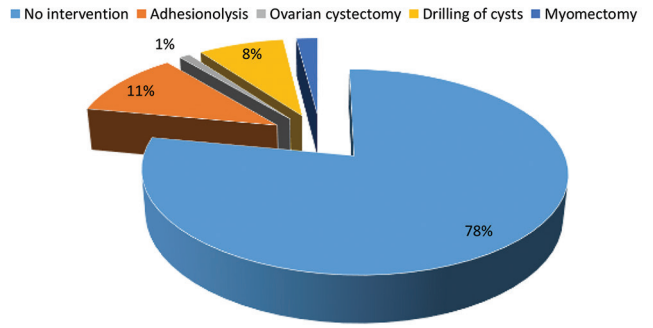
S. No	Lap. Finding	Infertility type Primary	Infertility type Secondary	Total
1.	Normal	12	10	22
2.	Pelvic Adhesions	06	03	09
3.	Endometriosis	18	4	22
4.	Tubal Block	04	01	05
5.	Myoma Uterus	03	00	03
6.	Perifimbrial Dilatation/ Hydrosalpinx	03	00	03
	Total	46	18	64

- The primary infertility was seen in 46 patients, out of which 12 patients had normal laparoscopic findings, six patients had pelvic adhesions, and 18 patients were with endometriosis in different stages (seven in Stage I, six in Stage II, three patients in Stage III, and Stage IV endometriosis was seen in two patients). When the patients with normal laparoscopic findings were compared with patients with abnormal laparoscopic findings, the relationship was statistically significant; however, in cases of secondary infertility, 18 in number, the normal laparoscopic findings were seen in ten patients and abnormal findings were seen in eight patients.

Laparoscopic interventions were done in the same setting as follows

S. no	Intervention	No. of patients	Percentage
1.	No intervention	50	78.1
2.	Adhesionolysis	07	10.9
3.	Ovarian cystectomy	01	1.5
4.	Drilling of cysts	05	7.8
5.	Myomectomy	01	1.5
	Total	64	100

- Among 64 patients, 50 (78.1%) patients had no intervention, while as 7 (10.9%) patients underwent adhesionolysis, one patient (1.5%) had ovarian cystectomy and one (1.5%) patients had undergone myomectomy, and five (7.8%) patients underwent drilling of cysts in the same sitting of laparoscopy [Tables 1 and 2].



DISCUSSION

In our prospective study conducted for 2 years in 64 patients with unexplained infertility, the percentage of patients with primary infertility was higher (71.88%) as compared to patients with secondary infertility (28.12%). Our results were similar to the study conducted by Bansal *et al.*[13] which revealed 64% cases of primary infertility and 36% cases of secondary infertility. The results of the present study showed that the mean duration of primary infertility (total 46 patients) and mean age was 4.424 years and 30.23 years, respectively, while as in cases of patients with secondary infertility, the mean duration of infertility and mean age was calculated as 5.722 years and 32.889 years, respectively. Our results were concordant to study conducted by Agarwal *et al.*,[13] where the mean age at presentation was 28 years in the primary infertility and 32 years in the secondary infertility. The duration of infertility was 2–5 years in majority of patients (59.1%) of the primary infertility, while it was over 5 years in majority of patients (77.7%) with the secondary infertility. None had <2 years of duration in case of primary or secondary infertility. Similar results were reported in a study by Ashraf and Metal.[14] In the present study on 64 patients, the normal laparoscopic findings were seen in 22 patients (34 %) and abnormal findings were discovered in 44 patients (66%). These results were similar to the study done by Bansal *et al.*,[13] where in their study, the percentage of normal findings on laparoscopy was 25% in the primary infertility cases, while as 75% patients were diagnosed with abnormal findings on laparoscopy. The laparoscopic findings in the present study were also concordant to Tsuji *et al.*,[15] Mushtaq *et al.*,[16] and Kumar *et al.*[17] Laparoscopic findings were normal in 19.3% of cases and abnormal in 80.3% of cases in Tsuji *et al.*[15] study, and similarly, 17.5% were normal and 82.5% were abnormal in Mushtaq R *et al.*16 study and 18% were normal and 82% were abnormal in the study by Kumar *et al.*[17] The most frequent laparoscopic findings in the present study were endometriosis seen in 22 (34%) patients. Our result was concordant with the study conducted by Duraker *et al.*[18] which showed endometriosis as cause of infertility in 28.4% and 32% patients, respectively. Periovarian adhesions are factors responsible for inhibition of ovum pickup and transport. In the present study, the frequency of pelvic adhesions was 14.1% with more number of patients with secondary infertility. These results are comparable to study by Bansal *et al.*[13] and Setarabintekasem *et al.*,[19] who in their studies documented the percentage of adhesions as 14%and 19.1%, respectively.

Even though HSG is widely used for assessment of tubal patency, an accurate assessment of tubal status cannot be obtained by HSG alone. The correct assessment of tubal status can only be made through laparoscopy, which allows for direct visualization. Tubal factor (tubal blockade and hydrosalpinx) was less prevalent causes of infertility in the present study constituting 7.8% and 4.7%, respectively. The studies conducted by Shetty and Shetty,[20] Samal *et al.*,[21] and Agarwal and Anand[22] study showed tubal factor as the most common factor of primary infertility due to subclinical PIDs in young women and adolescents because of poor perineal hygiene, particularly during menstrual periods. However, in the present study, the tubal blockage including the cases involving perifimbrial hydrosalpinx was less prevalent, and more so in secondary infertility. In the present study, various laparoscopic procedures were done at the same sitting. Fifty (78.1%) patients had no intervention, while as 7 (10.9%) patients under went adhesionolysis, one patient (1.5%) had ovarian cystectomy,

1 (1.5%) patient had undergone myomectomy, and 5 (7.8 %) patients had undergone drilling of cysts. The laparoscopic procedures are cause driven, and hence, any findings on laparoscopy can change line of management for infertility. Thus, the laparoscopy is a best modality for diagnostic as well as therapeutic intervention and when these laparoscopic procedures are compared with the data of many studies in terms of positive outcome of conception, these seem to be the modality of choice for any organic cause of infertility.

CONCLUSION

Following conclusions were drawn from the present study;

1. Primary infertility was the most common reason for diagnostic laparoscopic evaluation as 71.88% cases presented with the primary infertility. The secondary infertility was present in 28.12% cases.
2. Majority of the primary infertility group (51%) belonged to age group of 26–30 years and 48.1% of the secondary infertility cases presented in 31–35 years of age.
3. Majority of the primary infertility patients presented with 2–4 years duration and majority of the secondary infertility cases with more than 5 years duration of infertility.
4. Approximately 34% of cases had normal findings in diagnostic laparoscopy, whereas 66% of cases presented with pathological findings.
5. Most common pathological finding in the present study was endometriosis followed by pelvic adhesions.
6. Least common finding in present study was uterine myoma.
7. Therapeutic intervention (adhesiolysis, drilling of cysts and myomectomy) was done in 22% of patients.

Based on our results, we conclude that laparoscopy is beneficial for patients with unexplained infertility and normal HSG findings, because it is a reliable procedure in detecting specific causes of infertility in the pelvic cavity which is not diagnosed by other investigations. It provides direct and magnified view of all pelvic organs. It is a "definitive day care procedure" in evaluation of infertility, because it has the benefit of shorter hospital stay, less post-operative pain, and quick return of routine activity. Diagnostic laparoscopy can be used as a "ONETIME APPROACH" as evaluation and therapeutic procedures can be done in the same sitting as needed. From the present study, we can conclude that diagnostic laparoscopy is the gold standard tool in the evaluation of female infertility.

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How to cite this article: Shah U, Raina ZA, Rasool M. Laproscopic Findings in Patients with Normal Hysterosalpingography (HSG) Findings and Unexplained Infertility. Int J Sci Stud 2022;10(5):65-69.

Source of Support: Nil, **Conflicts of Interest:** None declared.