

# Hystero-Laparoscopic Findings in Patients with Unexplained Infertility : A cross-Sectional Study

## Original Article

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## ABSTRACT

**Background:** There is no uniform definition for unexplained infertility, and this varies depending on the duration of infertility and the age of the female partner. The laparoscopy plays an important role in evaluation of infertile women as it a better predictor of future fertility. Hysteroscopic procedures are highly appreciated mainly for their minimal invasiveness, suitability for office gynecology, cost effectiveness and safety. laparoscopy and hysteroscopy is considered the gold standard for evaluation infertility as the advantages of combined hysteroscopic and laparoscopic approach are proper assessment of the distal tubes and ovaries, the elimination of tubal spasm as a factor of infertility, absence of radiation, more precise application of instruments and confirmation of achievement of tubal patency during the procedure.

**Aim:** This study was done to evaluate the role of diagnostic hysteroscopy in the comprehensive work up of unexplained infertility, which would help in planning appropriate management.

**Methodology:** In the current study, we selected 168 women with unexplained infertility. The mean age of the studied group was  $30.3 \pm 4.3$  years. The mean duration of infertility was  $5.3 \pm 1.7$  years; ranging between 1.5 and 9 years. As hysteroscopy provides direct visual to the uterine cavity and laparoscopy inspects the pelvic cavity, we ask the question; Do hysteroscopy and/or laparoscopy add to the infertility work-up? At this study during hysteroscopic evaluation for the (168) studied patients with unexplained infertility, we reported that 68 (40.4%) of patients had normal uterine cavity and 100 (59.5%) of patients had abnormal uterine cavity.

**Conclusion:** In conclusion hystero-laparoscopy is beneficial in the work-up of patients with unexplained infertility and normal H.S.G findings because it has been demonstrated to be a reliable procedure in detecting infertility causes in the uterus and pelvic cavity that had not been previously detected by routine infertility work-up and that could then treat allowing post-operative pregnancies.

**Key Words:** Hysteroscopy, laparoscopy, unexplained infertility.

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## INTRODUCTION

Infertility is defined in specific terms as failure to conceive after one year of unprotected regular sexual intercourse. A broader view of infertility includes, not being able to carry a pregnancy to term and have a baby<sup>[1]</sup>.

Unexplained infertility refers to a diagnosis (or lack of one) made in couples in which standard investigations of tubal patency, ovulation, and semen analysis are normal. Depending on the number of investigations done and degree of evaluation of the couple, this term can be applied to as many as 30% of couples<sup>[2]</sup>.

Laparoscopic surgery also called Minimally Invasive Surgery (MIS), is a modern surgical technique in which operations in the abdomen are performed through small

incisions (usually 0.5-1.5) as opposed to the larger incisions needed in laparotomy<sup>[3]</sup>.

Hysteroscopy is a well-established diagnostic and operative technique, widely used to diagnose and treat many common gynecological abnormalities related to the uterine cavity. It also constitutes an important diagnostic step in the treatment of infertility. Hysteroscopic procedures are highly appreciated mainly for their minimal invasiveness, suitability for office gynecology, cost-effectiveness and safety<sup>[4]</sup>.

Combined laparoscopy and hysteroscopy are considered the gold standard for evaluation of infertility; as the advantages of combined hysteroscopic and laparoscopic approach is proper assessment of the distal tubes and

ovaries, the elimination of tubal spasm as a factor of infertility, absence of radiation, more precise application of instruments and confirmation of achievement of tubal patency during the procedure<sup>[5]</sup>.

**AIM OF THE WORK**

This study was done to evaluate the role of diagnostic hystero- laparoscopy (DHL) in the comprehensive work-up of unexplained infertility, which would help in planning appropriate management.

**PATIENTS AND METHODS**

This study was done in Obstetrics and Gynecology Department in Al -Sahel teaching hospital from January 2019 to January 2020. (Retrospective study) A cross-sectional study was undertaken on 168 women who were convenience diagnosed as unexplained infertility.

**Inclusion criteria**

1. Age ranging from 20 to 35 years old.
2. Satisfactory semen analysis.
3. Ultrasonic folliculometry was suggestive of ovulation.
4. Normal hormonal profile (serum FSH, LH and prolactin).
5. All patients underwent combined laparoscopy and hysteroscopy evaluation.

**Exclusion criteria**

1. Suspicion of pregnancy, to avoid the possibility of disturbing an implanting gestation. So, patients were examined in the early proliferative phase of the cycle.
2. Any detected causes of infertility.
3. Symptoms suggestive of pelvic or lower genital tract infection, to avoid exacerbating the symptoms.
4. Intractable cervical stenosis which would make insertion of hysteroscopy impossible.
5. Patients with advanced or uncontrolled medical diseases e.g. DM, rheumatic fever, TB or severe cardiovascular disease.
6. Patients with bad general condition, severe obesity and obvious organic pelvic pathology on clinical examination. Outcome measures are the effectiveness of combined hysteroscopy and laparoscopy in diagnosis of subtle uterine and tubo-ovarian factors of infertility.

**Each patient was investigated as follow**

1. Full history taking
2. examination.
3. Investigations of infertility including semen analysis for her husband, serum prolactin level, ovulation assessment and hysterosalpingography, etc....

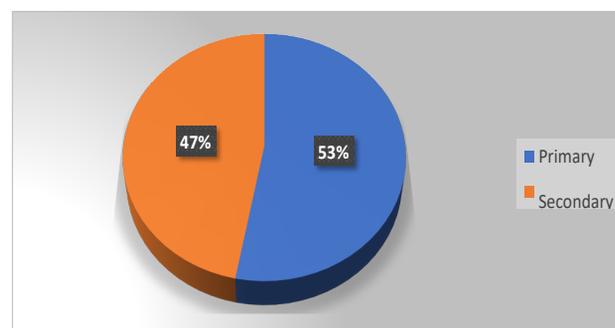
4. Transvaginal ultrasound and folliculometry.
5. Hysteroscopy.
6. Laparoscopy.

**RESULTS**

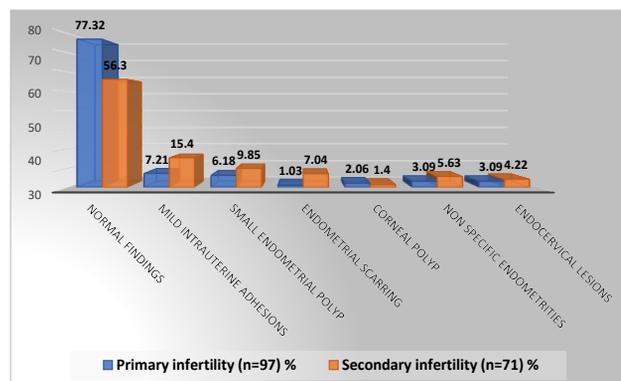
A total of 168 patients fulfilled the inclusion criteria of this retrospective study. The Demographic parameters of the groupe are given in (Table 1). Out of 168 patients, 97(47.7%) had primary and 71 (42.3%) had secondary infertility. The mean duration of infertility was 5.3±1.7 years. (Table 1) Pathologic laparoscopic abnormalities have been reported in 76.85% (114/168) patients. These included 62 patients with primary infertility (62/79=63.9%) and 52 patients with secondary infertility (52/71=73.23%) (Graph 1). The prevalence of pathologic laparoscopic findings did not significantly differ between patients with primary and secondary infertility. (Graph 2). Combined lesions (more than one abnormality detected in the same patient). The commonest reported pathologic Laparoscopic findings was pelvic adhesions (38/168=22.6%) followed by pelvic endometriosis (34\168=20.2%). Also, multiple laparoscopic abnormalities have been reported in 26 patients (15.47%). The type of pathologic laparoscopic abnormalities did not significantly differ between patients with primary and secondary infertility, (Graph 2). The incidence of pathologic hysteroscopic findings were significantly differ between patients with primary and secondary infertility, where, Hysteroscopically pathologic uterine abnormalities were reported in 53 patients out of 168 (31.54%) patients with unexplained infertility. (Graph 3). Noticeably, combined laparoscopic and hysteroscopic pathologic findings had been reported in 42 out of 168 patients (25%) (Table 2).

**Table 1:** Demographic profile of studied patients

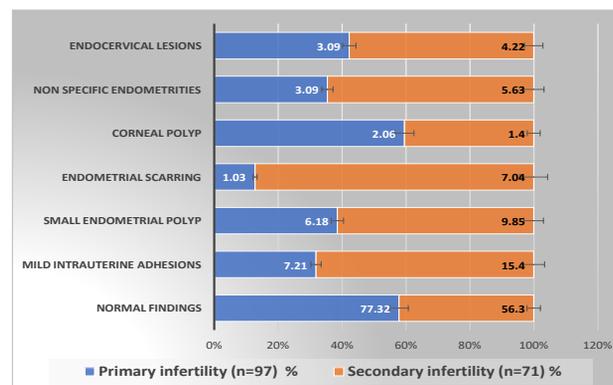
Demographic characteristics	n = 168
Age (years)	
Mean ± SD	28.2±2.2
Range	20-35
Duration of infertility (years)	
Mean ± SD	5.3 ± 1.7
Range	1.5-9
Type of infertility	
Primary	97 (47.7%)
Secondary	71 (42.3%)



**Graph 1:** Infertility types of the studied sample.



Graph 2: Laparoscopic findings in 168 patients.



Graph 3: Hysteroscopic findings of studied group.

Table 2: Combined laparoscopic and hysteroscopic findings in (168) women

Infertility	Normal laparoscopy		Abnormal laparoscopy		Total
	Normal hysteroscopy	Abnormal hysteroscopy	Normal hysteroscopy	Abnormal hysteroscopy	
Primary	29	6	46	16	97
Secondary	14	5	26	26	71
Total	43	11	72	42	168

## DISCUSSION

This study was done to evaluate the role of diagnostic hysterolaparoscopy in the comprehensive work up of unexplained infertility, which would help in planning appropriate management.

In the current study, we selected 168 women with unexplained infertility. The mean age of the studied group was  $30.3 \pm 4.3$  years. The mean duration of infertility was  $5.3 \pm 1.7$  years; ranging between 1.5 and 9 years. As hysteroscopy provides direct visual to the uterine cavity and laparoscopy inspects the pelvic cavity, we ask the question; Do hysteroscopy and/or laparoscopy add to the infertility work-up?

At this study during hysteroscopic evaluation for the (168) studied patients with unexplained infertility, we reported that 68 (40.4%) of patients had normal uterine cavity and 100 (59.5%) of patients had abnormal uterine cavity, this is not in agreement with El bareg *et al.*, (2018) who reported that out of 200 patients with unexplained infertility in whom standard infertility investigations were normal who underwent hysteroscopic evaluation 135(67.5%) patients showed normal uterine cavity, while abnormal cavity was detected in 65(32.5%) of patients.

Mild intrauterine adhesions was the most common hysteroscopic abnormality reported in our study (18/168,10.7%).

Similarly, El bareg *et al.*, (2018)<sup>[6]</sup> reported mild endometrial adhesions as the commonest hysteroscopic abnormality in their patients with unexplained infertility (28/200,14%).

Small endometrial polyp was the second reported hysteroscopic abnormality in the study (13/168,7.7%).

Endometrial polyps impair endometrial receptivity as evidenced by lower endometrial HOXA 10, and HOXA 11receptivity markers in patients with endometrial polyps.

Endometrial polyp was the commonest hysteroscopic uterine abnormality representing (10.13%) and (19.05%) in 100 women with primary and secondary infertility respectively reported by Shobha *et al.*, (2017)<sup>[7]</sup> however in this study they did not report if their patients had preliminary hystero-graphy before hysteroscopy or not. Hystero-graphy may suspect the diagnosis of endometrial polyp. Patients with suspected endometrial polyp on H.S.G were excluded from our study, so hysteroscopic diagnosis of small endometrial polps came as a second uterine abnormality in our study compared with that of Shobha *et al.*

On the other hand, Nayak *et al.*, (2016)<sup>[8]</sup> in a study of 300 infertile patients 206 (69%) with primary infertility and 94 (31%) with secondary infertility reported abnormal hysteroscopic findings in (18%) of cases with an intra uterine septum as the commonest abnormality in both groups (29 patients, 10%),

however in their study they did not mention that their patients underwent prior hystero-graphy which would detect double uterine cavity with suggestion of diagnosis.

In their retrospective study of 953 infertile women, Lasmar *et al.*, (2010) reported normal uterine cavities in 436 cases (45.8%) with intrauterine synechea being the most common reported abnormal finding (19.4%) in this study. This is similar to ours as mild intrauterine adhesions was the commonest reported uterine abnormality in our study (18/ 168 = 10.7%)<sup>[9]</sup>.

During their hysteroscopic evaluation of 100 infertile women, Makled *et al.*, (2014) reported endometrial polyps

in 31 patients, (31%) of these patients, only 18 (18%) were correctly diagnosed by transvaginal ultrasound (T.V.S)<sup>[10]</sup>.

Similarly, hysteroscopically diagnosed endometrial polyps (13/ 168 = 7.7%) and corneal polyps (3/ 168 = 1.8%) in our study had not been diagnosed by pre-hysteroscopic evaluation of endometrial cavity including T.V.S and hystero-graphy. This highlights the importance of hysteroscopic evaluation of patients with unexplained infertility with otherwise normal endometrial findings by both T.V.S and hystero-graphy.

Similarly, endometrial scarring (6/168=3.57%) and non-specific endometritis (7/168=4.1%) hysteroscopically reported in our study, have also been escaped diagnosis by both T.V.S and H.S.G.

This, further, establishes the importance of hysteroscopic evaluation of women with unexplained infertility.

According to our results, we would suggest that routine diagnostic hysteroscopy should be part of infertility work up in patients with unexplained infertility, both primary and secondary ones.

Noticeably, in our study hysteroscopic abnormalities were significantly higher in secondary (40/71= 43.7%) than primary infertility (22/97= 22.8%).

This is similar to that reported by Banu *et al.*, (2016) who reported that hysteroscopic abnormalities were significantly more in patients with secondary infertility (31/100= 31%) than those with primary infertility (18/100 = 18%)<sup>[11]</sup>.

This further stresses the importance of hysteroscopic evaluation of patients with unexplained secondary infertility.

Laparoscopic evaluation of 168 patients with unexplained infertility in our study revealed normal laparoscopy in 32.14% of them (54/ 168) pathological findings had been reported in 67.86% of them (114/168).

The incidence of laparoscopic abnormalities was non-significant different between primary infertility (62/97 = 63.91%) and secondary infertility (52/71 = 73.2%) groups.

Pelvic adhesions (38/162=22.6%) and endometriosis (34/168= 20.2%) were the most common abnormalities detected at laparoscopy.

Similar to ours, Bhandari *et al.*, (2015) reported endometriosis and adnexal adhesions as the commonest abnormalities detected at laparoscopy evaluation of 546 patients with unexplained infertility<sup>[12]</sup>.

Also, Poncet *et al.*, (2011), reported endometriosis and pelvic adhesions as the commonest laparoscopic findings in their 114 patients with unexplained infertility<sup>[13]</sup>.

Tsuji *et al.*, (2009) additionally reported laparoscopic pathological abnormalities in 46(80.7%) of their studied 57 patients with unexplained infertility and reported pelvic endometriosis in 36(63.2%) of patients, while peri tubal

adhesions were reported in 5(8.8%) with a high significant difference in incidence between them<sup>[14]</sup>.

In 2003; Capelo *et al.*, assessed the value of laparoscopic evaluation of the pelvis after failure to achieve pregnancy with clomiphene citrate usage for ovulation induction and they found that one third of these patients had significant pelvic pathologies that interfered with infertility potential<sup>[15]</sup>.

According to our results with abnormal laparoscopic findings in (67.86%) of studied patients with unexplained infertility, laparoscopic evaluation of these patients is a useful tool in the work-up of those patients with both diagnostic and therapeutic benefits.

This conclusion is contrary to that of Kahayoglu review article (2012) who concluded that omitting diagnostic laparoscopy after a normal hysterosalpingography in infertile patients with unexplained infertility and without risk factors for pelvic pathologies related to infertility is reasonable. This conclusion was based on his reporting that the majority of these patients (77%) became pregnant after several cycles of ovulation induction and/or assisted reproductive techniques, however arguably many of these patients had already several cycles of ovulation induction in addition, the costs of assisted reproductive techniques as IVF and ICSI is still high in our locality and cannot be offered for the majority of our patients, so diagnostic laparoscopy still has a role in further work-up and treatment of these patients<sup>[16]</sup>.

Lastly, on reviewing both hysteroscopic and laparoscopic findings of this study combined hysteroscopic and laparoscopic findings have been reported in 25% of studied women (42/168) this highlights the importance of concomitant hystero-laparoscopic evaluation of these patients.

Similarly, Vaid *et al.*, (2014) assessed the utility of hysterolaparoscopy as one step procedure and compared it with HSG, in subset of ovulatory infertility women with normal pelvic sonographies/ seminogram/ hormonal assays. They concluded that hysterolaparoscopy is far superior to HSG as it is more accurate and therapeutic intervention is possible at the same time. In selected infertile women, where other causes are excluded and tuboperitoneal pathology is strongly suspected, hystero- laparoscopy may be recommended as the first and final procedure, rather than subjecting the patients to two procedures<sup>[17]</sup>.

## CONCLUSION

In conclusion hystero-laparoscopy is beneficial in the work-up of patients with unexplained infertility and normal H.S.G findings because it has been demonstrated to be a reliable procedure in detecting infertility causes in the uterus and pelvic cavity that had not been previously detected by routine infertility work-up and that could then treat allowing post-operative pregnancies.

**CONFLICT OF INTERESTS**

There are no conflicts of interest.

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