International Journal of Clinical Obstetrics and Gynaecology

ISSN (P): 2522-6614
ISSN (E): 2522-6622

www.gynaecologyjournal.com
2021; 5(5): 232-236
Received: 22-07-2021
Accepted: 24-08-2021

Meenakshi Sharma
PG Scholar, Department of Obstetrics and Gynaecology, SMGS Hospital, GMC, Jammu, Jammu and Kashmir, India

Urvashi Sharma
PG Scholar, Department of Obstetrics and Gynaecology, SMGS Hospital, GMC, Jammu, Jammu and Kashmir, India

Ajay Wakhloo
Former Professor & HOD, Department of Obstetrics and Gynaecology, SMGS Hospital, GMC, Jammu, Jammu and Kashmir, India

Corresponding Author:
Meenakshi Sharma
PG Scholar, Department of Obstetrics and Gynaecology, SMGS Hospital, GMC, Jammu, Jammu and Kashmir, India

Role of endoscopy in the diagnosis and management of infertility

Meenakshi Sharma, Urvashi Sharma and Ajay Wakhloo

DOI: https://doi.org/10.33545/gynae.2021.v5.i5d.1045

Abstract
Background: Infertility is a common phenomenon affecting about 60 to 80 million couples all over the world. Identifying the causes of infertility is a challenging phenomenon; it needs precise evaluation to point out the factors responsible causes for infertility. The present study is amid to evaluate the role of endoscopy in comprehensive work up of infertility, which would help in planning appropriate management.
Methods: A total of 50 infertile women were included in the study who fulfilled the inclusion criteria The patients were selected according to following criteria**.** This prospective observational study was conducted in the department of Obstetrics and Gynaecology, at SMGS HOSPITAL, Government Medical College, Jammu over a period of 1 year from November 2019 to October 2020 after obtaining clearance from ethical committee.
Results: We observed that primary infertility was the most common reason for endoscopic evaluation (68%). The commonest age group of studied was (25-29) years constituting about(24%). The laparoscopic modality successfully revealed abnormal finding in (82%) but could not any pathology in (18%) patients. Diagnostic endoscopy was the most common procedure performed on endoscopy (28%) followed by ovarian cystectomy (14%) followed by endometrioma removal (12%). 14 out of 50 patients i.e. 28% underwent diagnostic procedure and in the rest of the patients, 36 out of 50, therapeutic procedure was done at the same time.
Conclusions: Endoscopy remains the mainstay of evaluation in modern investigations of infertility. Hysterolaparoscopy has become 3rd eye, in fact gold standard of gynecologist in diagnosing infertility and doing therapeutic intervention at the same time.

Keywords: infertility, primary infertility, secondary infertility, laparoscopy, hysteroscopy

Introduction
Generally infertility is a disease of the male or female reproductive system which is defined as the lack of ability to achieve pregnancy even after one year of regular unprotected intercourse. Broadly, infertility has been classified as primary or secondary infertility; primary infertility is a disease of reproductive system defined by the failure to achieve clinical pregnancy after exposing sexually active, non-contracepting and non-lactating women of child bearing age to pregnancy for 12 months while as secondary infertility refers to inability to conceive after a previous pregnancy. Howbeit, there is s widespread variation in defining infertility with respect to duration. Globally, most infertile couples suffer from primary infertility [1]**.** Subfertility is inability to ensure child bearing when it is wanted [2]. Infertility is a common phenomenon, around 60 to 80 million couples all over the world can be labeled suffering from infertility [3]**.** The prevalence of subfertility in industrialized countries has been quoted as 20% and seems on rise. 10-15% couples in India are infertile. Incidence of female infertility is 45.67% and male infertility is 54.33% and both can be involved in some cases. Infertility affects men and women alike as both genders report associated psychological distress, depression and low self-esteem [4]**.** In many cultures, the social repercussions of infertility compound the individual impact. Infertility has been observed to result in divorce, loss of economic resources and even the annulment of rights to burial grounds [5]. About 25-40% cases of infertility are attributed to male factor. Female factors contribute to 40-45% in etiology of infertility [6].
Identifying the cause of infertility is a challenging phenomenon; it needs precise evaluation to point out the very cause of infertility. Even after standard evaluation, 20-30% couples reported does not reflect any identifiable cause of their infertility.

However, some factors responsible for infertility in females are anovulatory disorders, tubal factors, endometriosis, uterine factors, cervical factors [7]. Most common factors in developing countries are untreated PID, post abortal infections, Post-partum infections, tuberculosis [8].

Unexplained infertility is one of exclusion and is made when tests for infertility evaluation fail to reveal abnormality. However, European Society for Human Reproduction and Embryology (ESHRE) has suggested standard diagnostic tests for infertility evaluation that include semen analysis, assessment of fallopian tubes by HSG or laparoscopy and laboratory assessment of ovulation. Laparoscopy is very helpful in diagnosing unsuspected pelvic pathology such as adhesions. Moreover, in a young couple, it is usually offered after all other tests are performed and discussed; in older couples or if the history suggests pelvic factors, it is often indicated as one of the primary methods of evaluation [9]. With recent improvements in assisted reproductive technology (ART), there has been tendency to bypass diagnostic laparoscopy and hysteroscopy after normal HSG and instead directly start infertility treatment. Therefore, the value of diagnostic laparoscopy in current fertility practice is under debate. Because of potential diagnostic and therapeutic benefits, patients with unexplained fertility and normal hysterosalpingography findings should undergo diagnostic laparoscopy prior to ART [9]. The indications for diagnostic laproscopy are infertility, chronic pelvic pain, pelvic tumors, pelvic inflammatory disease, genetal tuberculosis and ectopic pregnancy. Diagnostic laparoscopy is thus essential in determining the optimal management plan. It is frequently performed as a standard procedure in diagnosing infertility [10]

The present study is amid to evaluate the role of endoscopy in comprehensive work up of infertility, which would help in planning appropriate management.

Materials and Methods

This prospective observational study was conducted in the department of Obstetrics and Gynaecology, at SMGS HOSPITAL, Government Medical College, Jammu over a period of 1 year from November 2019 to October 2020 after obtaining clearance from ethical committee. The patients were selected according to following criteria:

Inclusion criteria

- Women with primary or secondary infertility
- Women with failed ovulation induction
- Abnormal findings in HSG

Exclusion criteria

- Medical disorders contraindicated for general anesthesia.
- Active pelvic infections
- Couples with male infertility

Detailed multifarious history was taken from the patients and complete physical and clinical examination was carried out including investigations required for general anesthesia, complete haemogram, serum biochemistry [LFT, RFT, electrolytes], hormone profile: serum TSH, T3, T4; serum prolactin, serum AMH, serum FSH, serum estrogen levels, Day 21 serum progesterone levels, Mantoux test, ESR, TVS, ECG,CXR as part of pre anesthetic evaluation.

Results and observations

In the present study, we observed that most of the patients constituting about (32%) were falling in the age group of 25 to 29 years followed by (30%) in the age group of (30-34). Around (24%) patients were having their age ranging from 20-24 years and only (7%) patients had their age either 35 years old or greater than 35 years old. Out of 50 studied patients, 34 cases (68%) were having primary infertility and 16 (32%) had secondary infertility. We determined the uterine factors of infertility with the help of laparoscopy diagnostic modality and observed that 17 patients constituting about 34% had uterine findings on laparoscopy. Of them the most common were fibroids constituting about 16%.

Table 1: Uterine factors of infertility on diagnostic laparoscopy

Uterine factors	Number	Percentage
Fibroids	8	16
PID	4	8
Endometriosis	2	4
Unicornuate	1	2
Bicornuate	1	2
Adherant	1	2
Total	17	34

In our study, 17 out of 50 patients had uterine findings on laparoscopy constituting about (34%) out of which fibroid uterus was the most common cause being seen in 8 out of 50 patients accounting for (16%) followed by PID seen in 4(8%) out of 50 patients. Rest of the patients had any of the uterine factors like; endometriosis, unicornuate, bicornuate or adherent, the proportion of which is reflected in above table 1. The tubal factors were also analyzed among infertile women on diagnostic laparoscopy and the following tubal factors were observed;

Table 2: Tubal factors of infertility on diagnostic laparoscopy

Tubal factors	Number	Percentage
Peritubal adhesions	7	14
Hydrosalphinx	9	18
Para ovarian cyst	4	8
Endometriosis	4	8
Tubo ovarian mass	2	4
Total	26	52

26 (52%) out of 50 patients had tubal findings on laparoscopy. Rest 24 patients (48%) had normal tubal anatomy on laparoscopy. The most common finding was hydrosalphinx seen in 9 (18%) followed by peritubal adhesions observed in 7(14%) patients followed by para ovarian cyst or fimbrial cyst seen in 4 (8%) patients and endometriosis seen in 4 patients (8%). Only 2 (4%) patients had tubo ovarian mass. The ovarian factors of infertility were also seen among studied patients via diagnostic laparoscopy.

Table 3: Ovarian factors of infertility on diagnostic laparoscopy

Ovarian factors	Number	Percentage
Endometrioma	15	30
Cystic	7	14
Adhesions	4	8
Enlarged	1	2
Functional cyst	1	2
PCOD	1	2
Total	29	58

We observed that 29 (58%) out of 50 patients showed ovarian causes on laparoscopy out of which endometriotic cyst was the most common finding observed in 15 (30%) followed by cystic ovaries reflected in 7 (14%) of patients. The proportion of rest of

the ovarian factors revealed on diagnostic laparoscopy is reflected in above table. We also analyzed peritoneal factors among infertile women through diagnostic laparoscopy and observed that only 5 (10%) out of 50 patients had peritoneal findings on laparoscopy out of which 3 (6%) had peritoneal adhesions and 2 (4%). Interestingly, (90%) had no peritoneal findings on laparoscopy.

Table 4: Peritoneal factors of infertility on diagnostic laparoscopy

Peritoneal factors	Number	Percentage
Endometriosis	2	4
Peritoneal adhesions	3	6
Total	5	10

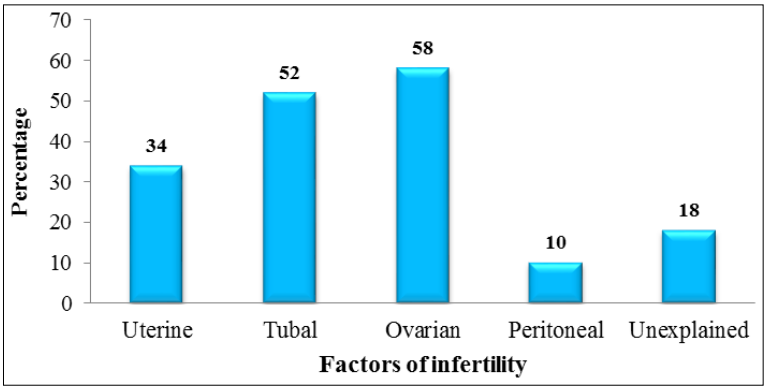

Fig 1: Various factors of infertility in laparoscopy

One can see that the most common cause among infertile patients revealed via diagnostic laparoscopy is ovarian constituting about (58%) followed by tubal factor observed in (52%). Uterine factors were observed in (34%) and peritoneal factors were found in (10%) patients. No detectable pathology was found on laparoscopy in (18%) of cases. However, more than one pathology was reflected in many of the patients at laparoscopy.

Table 5: Hysteroscopic findings of study patients

Hysteroscopic findings	Number	Percentage
Partial septum	1	2
Vaginal septum	1	2
Septate uterus	2	4
Endometriosis	2	4
Endometrial polyp	7	14
Submucus fibroid	3	6
Fibrosed cavity	3	6
Cervical stenosis	1	2
Fluffy endometrium	1	2
Normal findings	29	58
Total	50	100

The intrauterine findings were analyzed on hysteroscopy; endometrial polyps were found to be more common among studied patients constituting about (14%). Submucus firoid and fibrosed cavity were reflected in (6%) of cases each followed by septate uterus (4%) and endometriosis (4%). The partial septum was observed in (2%) cases and vaginal septum in (2%). Cervical stenosis was seen in (2%) cases and fluffy endometrium were also seen (2%) of patients. Rest of the patients accounting for (58%) reflected normal intrauterine findings on hysteroscopy.

Table 6: Operative procedure performed in study patients

Operative procedure	Number	Percentage
Diagnostic	14	28
Adhesiolysis	4	8
Hysteroscopic septal resection	4	8
Polpypectomy	4	8
Myomectomy	1	2
Cystectomy	7	14
Endometrioma removal	6	12
Cyst puncture	4	8
Ovarian drilling	1	2
Salpingectomy	1	2
Salpigoovariotomy	1	2
Dessication of endometriotic lesions	1	2
Dilatation of cervical canal	1	2
Opening of tubal block	1	2
Total	50	100

The patients were managed operatively; endoscopy was performed in most of the cases constituting about (28%) followed by ovarian cystectomy in (14%) of cases. Endometrioma removal was performed on (12%) of patients. The percentage of patients managed with any of the operative technique like adhesiolysis, hysteroscopic resection, polypectomy or cyst puncture were (8%) each. Rest of the patients were managed by myomectomy (2%) ovarian drilling (2%), salpingectomy (2%), Dessication of endometriotic lesions (2%), Salpigoovariotomy (2%), dilation of cervical canal (2%) and Opening of tubal block (2%).

Discussion

In the present study, it was found that primary infertility accounting for (68%) is more common than secondary infertility (32%).These findings were consistent with previous studies viz**.** Boricha YG *et al.,* (2011) which stated that primary infertility was present in 70% and secondary infertility was present in 30% of the study patients [11] and Kavitha G (2019) according to which primary infertility was found in 83% and secondary infertility in 17% of the patients [12]. Nagareshi *et al.,* (2016) supported primary infertility in 70% and secondary infertility in 30% [13]. Female age is an important factor for infertility. Majority of the patients (32%) in our study lie in the age group of 26-30 years which is consistent with findings of Sharma *et al.,* (2016) which is 61% followed by the age group of 31-35 years which is 30% in our study and 25% [14]. The finding that majority of the patients fall in the age group of 26-30years is also supported by Jirange *et al.,* (2019) where 20% patients were found in this category [15]. However, majority of the patients (40%) lie in the age group of 20-25 years in study conducted by Dawle S *et al.,* (2014) [16] which is not contrary to what we found. We observed that fibroids were the most common uterine pathology on laparoscopy (16%) followed by PID (8%), followed by endometriosis 2%. However, as per Wani Q *et al.,* (2014), endometriosis was the most common uterine cause for infertility on laparoscopy (16%) followed by adhesions in 10% followed by fibroid in 7% [17]. Proposed mechanism by which myomas affect fertility include cornual fibroids which compress interstitial segment of the tube, contractility of the uterus is disturbed by myoma thus interfering with ovum/sperm transport or embryo implantation and poor regional blood flow resulting in focal endometrial ulceration (Vollenhoven BJ *et al.,* 1990) [18].There is no algorithm containing fibroid number, volume and location which predicts the need to remove them. Removing fibroids increase pregnancy rates and decreases pregnancy complications. In the present study, endometrioma was the most common ovarian pathology detected in 30% of the cases. This was not consistent with Akhtarunnessa *et al.,* (2013) where PCOD was the most common ovarian cause of infertility in a study conducted on 900 patients [19]. Literature suggests that endometriosis can be primary cause of infertility or one of the contributing factors. Endometriotic lesions should be confirmed by doing the histological examination, especially those appearing non classical. Golden rule in suspected patients with endometriosis is visual confirmation by laparoscopy as mild endometriosis can be detected only by laparoscopy before labeling the patient as endometriotic and starting the treatment (Aleem M, 1995) [20]. Although, exact prevalence of endometriosis in general population of reproductive age group is not known, it is believed to be in range of 3% to 10% (Sharma *et al.,* 2016) [21]. In our study, it comes out to be 30%. We observed that hydrosalpinx was the most common tubal finding found in 18% of the patients on laparoscopy followed by peritubal adhesions which was 14% followed by endometriosis in 8%. However, Akhtarunnessa *et al.,* (2013) reported peritubal adhesions to be the most common finding in 11.33% of the patients [19]. Hydrosalpinx is chronic cystic swelling of fallopian tube caused by distal tubal obstruction, major cause being PID(old infection, STI) and endometriosis. In US, most common cause of tubal disease is infection with Chlamydia Trachomatis and N Gonorrhea. However, in developing countries, genital tuberculosis accounts for 3-5% of infertility cases. So, immigrant population from endemic countries can have this diagnosis. The likelihood of return of fertility after taking ATT is low, IVF-ET is the option (Aliyu, 2004) [22]. Negative history of PID can't clear the doubt because half of the patients with damaged tubes have no preceding history at all. Adhesions are seen even if surgery is done meticulously in the pelvis. Adhesions prevent normal tubal movement, ovum pick up and transfer of embryo to the uterus. Even if the previous ectopic surgery was treated medically, it increases the chances of tubal damage. In the present study, peritoneal adhesions were found in 6% of the patients followed by peritoneal endometriosis in 4% of the patients. This was in consonance with Waseem Talib *et al.,* (2014) and Sajid *et al.,* (2010) [23, 24]. However, Jirange *et al.,* (2019) reported endometriosis to be the most common cause [15]. Uterus, tubes and ovaries share the same space within the peritoneal cavity. So, defects of peritoneal cavity contribute to infertility. Endometriosis causes release of inflammatory factors in the peritoneal fluid thus decreasing the fertility. Adhesions are due to infection, endometriosis and prior surgery. Adhesions compromise motility of fallopian tubes and produce fimbrial blockage resulting into hydrosalpinx. The commonest pathology detected on laparoscopy was ovarian pathology in 58% of the cases. This is consistent with Sharma *et al.,* (2016) where 28% of the patients had ovarian pathology as the most common cause of infertility [21]. Madhuri N *et al.,* (2019) also demonstrated ovarian pathology to be the most common cause of infertility on laparoscopy [25]. Boricha YG *et al.,* (2011) also showed that most common pathology on laparoscopy was ovarian factor 32% [11]. Second most common cause among studied patients was found to be the tubal pathology accounting for 52% of the study patients. Thus, tubo ovarian pathology was the most common cause of infertility in the present study. Shimizu *et al.,* (2011) concluded that diagnostic hysteroscopy should be offered as an option for younger patients who desire spontaneous pregnancy because no significant difference was found in the cumulative pregnancy rate between patients proceeding to direct IVF and those doing so after laparoscopy. In the latter, the chance of spontaneous conception was higher (18%) [26]. In the present study, endometrial polyp was found to be the most common finding on hysteroscopy (14%) followed by septum which was seen in 8% of the study patients. This was in accordance to Zhang *et al.,* (2014) where 39.39% had endometrial polyp followed by septum in 9.09% of the study subjects [27]. However, Nagareshi *et al.,* (2016) reported septum to be the most common hysteroscopic finding in 11% and 6% of the patients respectively [28]. The incidence of asymptomatic endometrial polyp in women with infertility has been reported in range from 10% to 32% by Shalev J *et al.,* (2007) [29]. Symptoms include intermenstrual or post coital bleeding. A prospective study of 224 infertile women who underwent hysteroscopy showed 50% pregnancy rate after polypectomy (Shokeir TA *et al.,* 2004) [30]. Hysteroscopic removal of polyps in women with unexplained infertility may increase their chances of becoming pregnant (Bosteels J *et al.,* 2013) [10]. One study due to Perez-Medina (2005) suggested removal of small polyp less than 1 cm improves pregnancy rates

following IUI [31]. Most experts suggest removal of submucus fibroids if endometrial cavity is significantly distorted and complications like pelvic adhesion formation and Asherman syndrome cannot be ruled out. In addition to this, caesarean delivery is recommended if full thickness is cut. Treatment of Asherman syndrome is lysis of scar tissue on hysteroscopy. Sidky I (2018) concluded that routine hysteroscopy does not improve live birth rates in infertile women with a normal TVS of uterine cavity. Women with normal TVS should not be offered routine hysteroscopy [32].

Conclusion

Gynecological endoscopic surgery has revolutionized in past few decades because endoscopy remains the mainstay of evaluation in modern investigations of infertility. Endoscopic surgery for infertility is a boon to the suffering patient as it gives better results than traditional procedures Endometriotic cysts of the ovary and hydrosalpinx of the tube remain the most common causes of infertility. Peritoneal adhesions, adnexal adhesions and septum are unfortunately missed by routine pelvic examination and imaging procedures. These are the correctable abnormalities that can be easily detected by endoscopy. Septal resections are done by experienced hands after proper selection of cases. Hysterolaparoscopy has become 3rd eye of gynecologist in diagnosing infertility and doing therapeutic intervention at the same time.

References

1. Inhorn MC. Global infertility and the globalization of new reproductive technologies: Illustration from Egypt. Soc Sci Med 2003;56:1837-51.
2. Penzias AS. Infertility. Contemporary office based evaluation and treatment. Current Obstet Gynecol Clin N Am 2000;27:473-86.
3. Fathalla MF. Reproductive health: A global overview. Early Human Development 1992;29:35-42.
4. Unisa S. Childlessness in Andhra Pradesh, India: Treatment-seeking and consequences. Reprod Health Matters 1999;7:54-64
5. Zargar AH, Wani AI, Masoodi SR, Laway BA, Salahuddin SM. Epidemiologic and etiologic aspects of primary infertility in the Kashmir region of India. Fertil Steril 1997;68:637-43.
6. Miller JH, Weinberg RK, Canino NL, Klein NA, Soules MR. The pattern of infertility diagnosis in women of advanced reproductive age. Am J Obstet Gynecol 1999;181:952-57.
7. Greil AL, Slauson-Blevins K, Mc Quillan J. The experience of infertility: a review of recent literature. Social Health Illn 2010;32:140-62
8. Jose Miller AB, Boyden JW, Frey KA. Infertility. American Family Physician 2007;75:849-56.
9. Tsuji I, Ami K, Miyazaki A, Hujinami N, Hoshiai H. Benefit of diagnostic laparoscopy for patients with unexplained infertility and normal hysterosalphingography findings. Tohoku J Exp Med 2009;219(1):39-42.
10. Bosteels J, Kasius J, Weyers S, Broekmans FJ, Mol BJ, D'Hooghe TM. Hysteroscopy for treating subfertility associated with suspected major uterine cavity abnormalities. Cochrane Database Syst Rev 2013;31;(1):CD009461.
11. Kavitha G and Renukadevi B. Role of hysterolaparoscopy with chromopertubation as a diagnostic cum therapeutic tool in evaluation and treatment of female infertility. The new Indian Journal of OBGYN 2019;6(1):15-19.
12. Nagarashi DR, Panda S, Indira, Kumari IKR. Role of diagnostic hysteron-laparoscopy (dhl) in the assessment of infertility-A retrospective analysis. J Adv Med Dent Scie Res 2016;4(5):24-27.
13. Sharma S, Pandey VP, Sharma ST, Masand DL. Hysterlaparoscopy – 'See and Treat' Infertility, is a Reality in Modern Gynecological Practice. Annals of International Medical and Dental Research 2016;2(5):9-13
14. Dawle S, Bhalerao A, Kumare B, Bhalerao K. Role of Hysterolaparoscopy in the evaluation of primary infertility. J of Evolution of Med and Dent Sci 2014;3(20):5496-5500
15. Vollenhoven BJ, Lawrence AS, Healy DL. Uterine fibroids: A clinical review. Br J Obstet Gynecol 1990;97:285-98.
16. Akhtarunnessa, Chowdhury TA, Ara I, Gazi LK, Biswas B. Role of Diagnostic Laparoscopy in evaluation of infertile women. Bangladesh J Obstet Gynaecol 2013;28(2):88-91.
17. Aleem M, BFashir A. Endometriosis in diagnostic laparoscopy. Specialist 1995;11:103-07.
18. Sharma S, Pandey VP, Sharma ST, Masand DL. Hysterlaparoscopy – 'See and Treat' Infertility, is a Reality in Modern Gynecological Practice. Annals of International Medical and Dental Research 2016;2(5):9-13.
19. Aliyu MH, Aliyu SH, Salihu HM. Female genital tuberculosis: a global review. Int J Fertil Womens Med 2004;49(3):123-36.
20. Shimizu Y, Yamaguchi W, Takashima A, Kaku S, Kita N, Murakami T. Long term cumulative pregnancy rate in women with unexplained infertility after laparoscopic surgery followed by *in vitro* fertilization oe *in vitro* fertilization alone. J Obstet Gynecol Res 2011;37:412-15.
21. Zhang E, Zhang Y, Li Fang, Qingdong Li, Jian Gu. Combined hysterolaparoscopy for the diagnosis of infertility: a retrospective study of 132 patients in China. Mater Sociomed 2014;26(3):156-57.
22. Nagarashi DR, Panda S, Indira, Kumari IKR. Role of diagnostic hysteron-laparoscopy (dhl) in the assessment of infertility-A retrospective analysis. J Adv Med Dent Scie Res 2016;4(5):24-27.
23. Shalev J, Meizner I, Bar Hava I, Dicker D, Mashiach R, Ben Rafael Z. Predictive value of transvaginal sonography performed before routine diagnostic hysteroscopy for evaluation of infertility. Fertil Steril 2007;73:412-17.
24. Shokeir T. Regarding "Accuracy of tubal patency assessment during diagnostic hysteroscopy compared with laparoscopy in infertile women: A retrospective cohort study". J Minin Invasive Gynecol 2018;25:542.
25. Perez Medina T, Bajo-Arenas J, Salazar F, Redendo T, Sanfrutos L, Alvarez P *et al*. Endometrial polyps and their implication in the pregnancy rates of patients undergoing intrauterine insemination: a prospective, randomized study. Hum Reprod 2005;20(6):1632-35.
26. Sidky I. Role of hysteroscopy in infertility assessment. Int J Gynecol Clin Pract 2018;5:140.