

Role of Hysteroscopy to Improve Live Birth Rate among Secondary Infertile Couples

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Abstract: **Introduction:** Abnormalities in the uterus that related to infertility have been found in 34% to 62% of infertile women seeking treatment. Hysteroscopy can detect the intrauterine pathology and provide treatment to restore the normal endometrial environment for fertility. **Objective:** This study aims to assess the efficacy of hysteroscopy in improving the pregnancy rate PR and live birth rate LBR among secondary infertile women. **Material and Methods:** it is a retrospective involves 220 women with secondary infertile. They were two groups, study group;114 cases had a hysteroscopy, control group;106 cases did not perform a hysteroscopy. Hysteroscopy was performed with a standard sequence and the findings were recorded. The pregnancy outcome for both groups was also recorded. **Results:** The average age of the patients (35.01 ± 5.48 years) with a period of secondary infertility (5.4 ± 3.25 years). 38.77% of cases para 1 and 15.71% had an abortion. The most hysteroscopic findings were endometritis (35.09%). For the study and control group; PR was positive in 40.35%, 26.41% respectively while LBR 78.26%, 57.14% respectively. The study showed significant differences between the two groups in PR and LBR 0.01 and 0.02 respectively (P-value <0.05). **Conclusions:** PR and LBR were significantly higher among the group who had hysteroscopy intervention. In order to improve the LBR, routine diagnostic hysteroscopy should be done as an infertility workup among secondary infertile couples.

Keywords: Hysteroscopy, Secondary infertility

1. Introduction

Abnormalities in the uterus that related to infertility have been found in 34% to 62% of infertile women seeking treatment [1]. These uterine abnormalities causing infertility by resulting in structural and functional impairment of endometrium. Consequently, the endometrium becomes unhealthy for implantation. Therefore, it is crucial for every infertile woman to evaluate the endometrium as an important step in an investigation for infertility [2, 3].

There a various investigation to evaluate uterine cavities such as Transvaginal ultrasonography, Hysterosalpingography and Hysteroscopy. They are non-invasive, cost-effective tools to assess the uterine cavity; However, it is unable to detect some important endometrial pathologies. Consequently, to cover the defect following previous tools, the hysteroscopy is crucial and need to be done as infertility workup [4, 5].

World Health Organization has recommended hysteroscopy only in women with suspected intrauterine abnormalities diagnosis. However, many clinicians consider Hysteroscopy as a most definite tool in comparison to the others that carry high false positive and false negative results for the evaluation of the uterine cavity. Moreover, by using hysteroscopy can do both diagnosing the pathologies as well as managing them simultaneously [5, 6].

Nowadays, regardless of guidelines; Hysteroscopy is considered the gold standard technique for evaluating the uterine cavity [7, 8]. However, using hysteroscopy without suspicion for uterine pathology is still questionable for many reasons. Such as it needs general anaesthesia as well as a distension media which required careful fluid monitoring fluid overload and electrolyte imbalance [8, 9].

Therefore, it is proposed that even in the absence of suspected abnormality, hysteroscopy should be considered. This study aims to determine the role of hysteroscopy to improve PR and LBR among the secondary infertile couple.

2. Materials and Methods

This is a retrospective study was carried out at Misurata National Centre For Diagnosis and Treatment of Infertility. 220 secondary Infertile women (those with a previous abortion/ectopic or childbirth) were included in the study in two different groups. 114 patients who underwent hysteroscopy and 106 patients who had not done a hysteroscopy. All patients had information about the procedure of hysteroscopy (steps, benefits, complications). Cases with male factor infertility, history of surgical sterilization, premature ovarian failure and other hormonal disturbance (thyroid /prolactin) had been excluded from the study.

Hysteroscopy was performed under general anaesthesia and using normal saline as a distension media with inflow pressure of 150 mmHg and outflow pressure of 0.5. Hysteroscopy machine used with 2.9mm 300 BETTOCHI with additional 1mm sheath, HD camera and another instrument such as grasping forceps, scissors, or bipolar electrode might be needed.

In this study, all the hysteroscopy was carried out during the proliferative phase of the menstrual cycle. After inserting the vaginal speculum, the cervix became clear and the hysteroscopic visualization was done in steps which include endocervical canal and the whole uterine cavity with both Ostia. Endometrial biopsy was taken for histopathological

examination. If any pathology was diagnosed, the appropriate operative procedure was done at the same time.

Operative procedures including hysteroscopic resection of endometrial polyps and excision of the intrauterine septum and postoperative management for endometritis, atrophic endometrium and intra-uterine adhesion (insertion of a coil) were performed. The whole procedure (findings and management required) were recorded in a standard report for the patients' file then data were collected and analyzed.

Statistical analysis

Data were analyzed by software SPSS 23.0. Descriptive statistics were presented in terms of mean \pm standard deviation for continuous variables. Whereas, the categorical data are presented by counts (percentage). The student's t-test was used for comparison of the various data. P-value <0.05 was considered as significant.

3. Results

The patients included in this study were 220 with an average age (35.01 ± 5.48 years). All patients are secondary infertile with different period of infertility (5.4 ± 3.25 years) as an average of duration. Regarding the ovarian function, all hormones on day 2/3 of a cycle within normal averages level were FSH, LH and AMH 7.4 ± 3.2 , 5.4 ± 2.2 , 3.7 ± 3.4 respectively. All couples have normal semen analysis and their medical history is irrelevant. Pre-hysteroscopic uterine investigations by HSG were available for (78.99%) of cases. HSG were normal in (62.01%) patients and the abnormalities as following; tubal block (16.12%), hydrosalpinx (0.61%), peritubal adhesion (0.20%) and uterine anomalies (Bicornuate/unihorn) (0.21%).

Table 1: Demographic characters of the women included in the study

Parameter	All Cases (220)
Age (Y)	35.01 ± 5.48
Duration of infertility (Y)	5.4 ± 3.25
Basal Ovarian Hormonal Profile:	
FSH	7.4 ± 3.2
LH	5.4 ± 2.2
AMH	3.7 ± 3.4
Previous Obstetric History:	
Para 1	38.77%
Para >1 (2-5)	40.07%
Abortion	15.71%
Ectopic Pregnancy	5.45%
Hysterosalpingography (HSG):	
Not done	21.04%
Normal	62.01%
Blocked Tubes	16.12%
Hydrosalpinx	0.61%
Adhesion	0.20%
Uterine anomalies	0.21%

For the study group, the most common indication for diagnostic hysteroscopy was as a part of an early infertility workup and only a few cases diagnosed by HSG with uterine anomalies such as Bicornuate uterus and uni-horn uterus so indicated for hysteroscopy. The hysteroscopy findings for the study group (114) were shown in table 2. 29.8% of cases revealed normal hysteroscopy finding and the endometritis

was represented the most common abnormal finding (35.09%), followed by uterine septa (20.18%). Other uterine abnormalities involve polype, intra-uterine synechia, atrophic endometrial (5.26%, 2.63%, 2.63%) respectively, and one case had been diagnosed with adenocarcinoma of the uterus after histopathology result. Moreover, four cases had been diagnosed with uterine anomalies namely Bicornuate uterus and uni-horn uterus.

Table 2: Findings of Hysteroscopy for the study group and their rate of pregnancy following hysteroscopy

Findings	Cases n (%)	Pregnancy rate (n)
Normal finding	34 (29.82 %)	9
Endometritis	40 (35.09%)	18
Endometrial septa	23 (20.18%)	11
Endometrial polyps	6 (5.26%)	6
Atrophic endometrial	3 (2.63%)	0
Uterine anomalies	4 (3.51%)	2
Intrauterine adhesions	3 (2.63%)	0
Adenocarcinoma	1 (0.88%)	0

This study revealed that the pregnancy rate post hysteroscopy is higher than the control group who did not do hysteroscopy (40.35%, 26.41% respectively). Most cases who get pregnant post hysteroscopy was following treatment of endometritis and polypectomy. On the other hand, the cases had no benefit from hysteroscopy are cases with intrauterine adhesion and atrophic endometrium (table 2). With regard to the positive pregnancy among both groups, the live birth rate was significantly higher among the study group (p value 0.02). that is clearly explained in table 3.

Table 3: Differences in the outcome between the control and study group

Outcome N (%)	Study (114) group	Control (106) group	P-value
Positive Pregnancy	46 (40.35%)	28 (26.41%)	0.01
Negative Pregnancy	68 (56.56%)	78 (73.58%)	
LBR	36 (78.26%)	16 (57.14%)	0.02
Abortion	8 (17.39%)	12 (42.86%)	
Ectopic pregnancy	2 (4.35%)	0 (0%)	

That is clear about the effect of hysteroscopy in improving the pregnancy rate especially among couples who had conceived previously. In order to improve the pregnancy outcome, that result encourages the consideration of diagnostic and treatment of hysteroscopy as a primary tool in infertility workup, especially among secondary infertile couples.

4. Discussion

Infertility causes involve uterine causes, so the evaluation of the uterine cavity is considered as a crucial step for infertile investigation. Any abnormalities in the uterine cavity can negatively effect on the endometrium and so interfering with implantation stage as well as the growing of the embryos. The technique for evaluation of uterine cavity are many (TSV, HSG); however; nowadays hysteroscopy is considered as a most definite technique in infertility as can be used for diagnosing and treatment of uterine pathology under direct view [5].

In the present study, in a comparison between study group (who had hysteroscopy) and control group, the hysteroscopic technique has provided an improvement in pregnancy rate as well as live birth rate among a secondary infertile couple. The uterine abnormalities were representing in 70.18% of the cases and most commonly were endometritis followed by polype and uterine septa. It was noted that the incidence of pregnancy following polypectomy and aggressive treatment of endometritis carry the highest percentage.

The incidence of intrauterine abnormalities is highly suspected among secondary infertile women that due to history of postpartum trauma, other procedure such as Dilatation and curettage, history of cesarean section and infections [10]. Several studies revealed that just performing a hysteroscopy will eventually helpful in the management of various uterine cavity abnormalities such as removal endometrial polyps, submucousmyomas, also intrauterine adhesion. Consequently, improving the implantation rate as well as the live birth rate [11].

On the other hand, there are cases have conceived post hysteroscopy with normal finding (absence of intrauterine pathology). Some studies explained that by the process of using normal saline as distension media during hysteroscopy will irrigate the uterine cavity and so apposite effect on the pregnancy outcome [6]. Previous research was positively correlated with the result in the present study regarding the higher pregnancy outcome post polypectomy and uterine septal resection as a space that interferes with the implantation of embryo. Also, lower pregnancy rate among cases with uterine anomalies and that explained probably due to an abnormal configuration of the uterine cavity (mechanical factor) [11, 12].

Failure of embryo's implantation could be due to mechanical or biochemical defect and some researchers believe that after hysteroscopy with no evidence of intrauterine pathology, the pregnancy can be continued further than 20-week gestation and this gives the possibility of a higher rate of live birth. So the importance of doing hysteroscopy is a great value for diagnosis even unexpected pathology that interferes with the embryo implantation or causing recurrent pregnancy loss as well as provides treatment in the same technique sitting [13].

On the other hand, some studies revealed to some point that there are possible complications related to the procedure following hysteroscopy such as anaesthesia complication, fluid overload and infection (endometritis). That complications make some gynaecologist thinking about the use of hysteroscopy without clear pathology (diagnosed by other tools TVU, HSG). However, that complications could be control fluid pressure flow and reduce the time need under anaesthesia as can as possible and use of prophylactic antibiotics [8, 9, 14].

5. Conclusion

Prior to imparking in any treatment for infertility that will cost much, arrangement for the hysteroscopy is the golden technique that could be diagnosed various missed uterine pathology and managed them in the same time also; it improves the pregnancy outcome and the live birth rate even

in the absence of pathology by hysteroscopy. In addition, due to its retrospective study, some information such as the findings by TVS and HSG (to compare with hysteroscopy's findings) were not available, it is recommended to apply this as a prospective study on a large population group to deeply specify and give more precise results.

References

- [1] Pundir J, El Toukhy T, Uterine cavity assessment prior to IVF. *Women's Health (LondEngl)* (2010), 6 (6): 841-848.
- [2] Attilio D., Spiezio S., Costantino C., Silvia M., Marialuigia S., Vanna P., Carlo A., Giuseppe P., Carmine N., Giuseppe B., Efficacy of hysteroscopy in improving reproductive outcomes of infertile couples: a systematic review and meta-analysis, *Human Reproduction Update*, Volume 22, Issue 4, July/August 2016, Pages 479–496.
- [3] Maryam N, Hadieh H, Ahmadi F, Fatemeh N, Mohammad C Diagnostic Accuracy of Transvaginal Sonography in the Detection of Uterine Abnormalities in Infertile Women. *Iran J Radiol* (2012), 9 (3): 139-144.
- [4] Seshadri S, El-Toukhy T, Douiri A, Jayaprakasan K, Khalaf Y Diagnostic accuracy of saline infusion sonography in the evaluation of uterine cavity abnormalities prior to assisted reproductive techniques: a systematic review and meta-analyses. *Human Reproduction Update* (2015), 21 (2): 262-274.
- [5] Practice committee of American Society for Reproductive Medicine. Diagnostic evaluation of the infertile female (2015): a committee opinion. Birmingham, AL: American Society for Reproductive Medicine. *Fertility Sterility* 103 (6): e44-e50.
- [6] Seyam E., Hassan M., Mohamed T., Mahmoud H., Ibrahim M. Pregnancy Outcome after Office Microhysteroscopy in Women with Unexplained Infertility. *Int J Fertility Sterility* (2015), 9 (2): 168-175.
- [7] El-Mazny A, Abou-Salem N, El-Sherbiny W, Saber W. Outpatient hysteroscopy: a routine investigation before assisted reproductive techniques? *Fertility Sterility*.2011;95 (1):272–276.
- [8] Cooper N., Smith P, Khan K., Clark T., A systematic review of the effect of the distension medium on pain during outpatient hysteroscopy. *Fertility Sterility*.2011;95 (1):264–271.
- [9] Kowalczyk D, Guzikowski W, Więcek J, Sioma-Markowska U. Clinical value of real time 3D sonohysterography and 2D sonohysterography in comparison to hysteroscopy with subsequent histopathological examination in perimenopausal women with abnormal uterine bleeding. *Neuro Endocrinol Lett*.2012;33 (2):212–216.
- [10] Arora P., Tarneja P., Iyer B., Duggal S. and Sharma R., Evaluation of Cases of Secondary Infertility by Hysterosalpingography, Hysteroscopy, *Medical Journal Armed Forces India*. Oct; 58 (4): 319–322. Published online 2011 Jul 21. doi: 10.1016/S0377-1237 (02)80087-9
- [11] Attilio D., Spiezio S., Costantino D., Carlo S., Marialuigia S., Vanna P., Carlo A., Giuseppe D.,

Giuseppe B., Efficacy of hysteroscopy in improving reproductive outcomes of infertile couples: a systematic review and meta-analysis *Human Reproduction Update*, 2016, Volume 22, Issue 4, July/August, Pages 479–496.

- [12] Jain N., Manchanda R., Lekhi A. and Chithra S., Role of Hysteroscopy in Evaluation of Infertility: A Retrospective Study of 100 Cases, *Open Access Journal of Gynecology*, Volume 1 Issue 3 (2016), ISSN: 2474-9230.
- [13] Ahmed M. El Huseiny BADEEA S. Soliman, Hysteroscopic findings in infertile women: A retrospective study, *Middle East Fertility Society Journal*, 2013, Volume 18, Issue 3, September Pages 154-158.
- [14] El-Toukhy T., Khalaf Y., Coomarasamy A., Tabanelli C., Gordts S., Gordts S., Mardesic T., Al-Shawaf T., A multicenter randomized study of pre-IVF outpatient hysteroscopy in women with recurrent IVF-ET failure-the trophy trial, *Human Reproduction*, 2014, 29: 36-37.