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Effectiveness of hysteroscopic surgery for intrauterine lesions on pregnancy rates in patients with primary infertility

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Abstract--Background: Infertility is an important part of reproductive health that has a big impact on society. The use of hysteroscopy in routine gynaecological practise was a real revolution in diagnosing and treating intrauterine disease, which had a big impact on how these diseases were treated and how they were dealt with. Objective: To find out how well therapeutic intervention through operative hysteroscopy works in increasing the number of pregnancy rate in women with primary infertility with diagnosed intrauterine lesions. Patients and methods: In the current study, fifty patients, who have been met the requirements of the inclusion and exclusion criteria participated prospectively in this study to evaluate the impact of detected and treated uterine and cervical abnormalities on the pregnancy rate and reproductive outcome. They underwent operative hysteroscopy for resection of submucous myoma, polypectomy or resection of intrauterine septum during the follicular phase of their cycles. Results: After operative hysteroscopy the reproductive outcome was 29 out of 50 patients (58%) achieved pregnancy. Of those, 26 women (52%) had singleton pregnancies while 3 women (6%) had twin pregnancies. Of the 29 patients who achieved pregnancy, 7 patients (24%) aborted, 17 patients (59%) continued to term pregnancy and 5 patients (17%) had preterm delivery and live births was 22 (76%). Conclusion: Our research shows that fixing any uterine problems, no

matter how small or minor, increases the chance of getting pregnant in infertile women who don't have any other problems.

Keywords---hysteroscopic surgery, intrauterine lesions, primary infertility.

Introduction

Small lesions inside the uterus have been thought to cause infertility in a number of ways, but none of them are certain. However, they are likely to cause implantation failure. 1 Because hysteroscopic surgery can be done through the vaginal route, the surgery is easy and the patient stays in the hospital for less time. 2 Hysteroscopy with surgery is a well-known way to treat intrauterine lesions like submucosal fibroids, polyps, and uterine septa. 3 Hysteroscopy is the best way to find out what's wrong with endometrial polyps and how to treat them. Several studies of women with polyps and unexplained infertility showed that the chance of getting pregnant went up significantly after hysteroscopic polypectomy. 4

Myomas that are under the mucosa may be reachable by operative hysteroscopy, which is the standard way to do surgery. Several retrospective studies of small case series showed that infertile women who had submucosal myomas removed with a hysteroscope were able to have children. 5 Many studies have found that removing the septum of the uterus using a hysteroscope is helpful and increases the chances of getting pregnant after the procedure. 6 Although hysteroscopy is considered to be the gold standard for the evaluation of the uterine cavity worldwide,³ as well as enabling the treatment of any detected intrauterine anomaly, Recent research suggests that the role of hysteroscopy should be reevaluated, since using it at certain points in the clinical work-up may help infertile couples have children. 7

Few and scattered pieces of information are available now about this interesting topic. In particular, it is not clear if there are certain groups of infertile people who might be better candidates for hysteroscopy or if the timing of hysteroscopy could change their chances of getting pregnant. 7 In general, the rate of successful pregnancies goes up a lot after operative hysteroscopy and medical treatment of these structural problems with the uterus. It seems likely that in these cases, the best treatment is to make the uterine cavity like it was before. 8 The goal of this prospective study was to find out how well operative hysteroscopy works as a therapeutic intervention to increase the number of pregnancies in women with primary infertility who have been diagnosed with intrauterine lesions.

Patients and Methods

The study was done at El-Hussein university hospital's Obstetrics and Gynecology department, period from June 2021 to June 2022. 50 Female patients with primary infertility undergoing operative hysteroscopic resection of intrauterine lesions i.e. sub-mucous fibroids, polyps &/or septa.

Inclusion criteria

Female patients undergoing operative hysteroscopy (patient with Submucosal leiomyoma; Uterine polyps; Uterine septum; Intrauterine adhesions (IUA), synechia, or Asherman syndrome; Cannulation of fallopian tube ostia), female patients with primary infertility, and age: childbearing period.

Exclusion criteria

Marked cervical stenosis, recent or current pelvic inflammatory disease, known cervical cancer, pregnancy, heavy uterine bleeding, or a recent uterine perforation are all reasons not to do a hysteroscopy., patients with secondary infertility, previous cervical surgery, and patients with associated male factor infertility.

Methodology

- All cases were received both oral and written informed consent after explaining the details of the study for them, as agreed upon by the ethical committee.
- They were undergoing hysteroscopic resection of sub-mucous myoma, polypectomy or resection of intrauterine septum.
- Indication for hysteroscopic resection was on primary infertility.
- Selection of patients was based on appropriate indications, complete medical history, and physical examinations including; general, abdominal, pelvic examinations and ultrasound imaging.
- Routine laboratory evaluations, Hormonal assay and Semen analysis for husbands was carried out.
- Information about the subsequent fertility was obtained from hospital records, physicians and direct reports from the patients.
- The fertility and the outcome of pregnancies after operative hysteroscopy was analyzed according to the type of intrauterine lesion (sub-mucous fibroid, polyp and septum) and type of the main complaints.

Possible Risk: Risk of complications of operative hysteroscopy.

Primary outcomes (Most important outcomes to be assessed): Fertility and the outcome of pregnancies that was occurred within 12 months' post hysteroscopic repair.

Secondary outcome parameters (other outcomes to be assessed): (a) Improvement of any associated complaints. (b) Any complications or side effects.

Statistical analysis

The collected data were coded, processed, and analysed using the SPSS (Statistical Package for Social Sciences) version 22 for Windows® (IBM SPSS Inc, Chicago, IL, USA). The Shapiro Walk test was used to find out if the data were spread out in a normal way. To show qualitative data, the number of occurrences and the relative percentages were used. Use the Chi-square test (2) to find out how different two or more groups of qualitative variables are from each other. Quantitative information was given in the form of mean standard deviation (Standard deviation). The independent samples t-test was used to compare two

groups of normally distributed variables that were not from the same group (parametric data). People thought that the 0.05 P value was important.

Results

Sociodemographic profile	groups	No. (%)
Age	≤ 25	15(30%)
	25 – 30 yrs	17(34%)
	≥ 30	18(36%)
Duration of infertility	3 yrs or less	20(40%)
	> 3 – 6 yrs	18(36%)
	> 6 yrs	12(24%)
Menarche age	< 13 yrs	31(62%)
	≥13 yrs	19(38%)
BMI(kg/m ²)	<25	12(24%)
	≥25	38(76%)
Job	Housewife	32(64%)
	Work	18(36%)

Table (1): Socio-demographic profile of the participants (n=50).

Table 1 shows the socio-demographic profile of the participants. The age range was 22-42 years with a mean of 28.9±4.3 years, the mean duration of infertility was 4.6±3.3 years and that of BMI of the participants were 27.6±3.9 kg/ m².

Outcome	Pregnancy		Spontaneous abortion	Preterm <36 weeks		Term		Live births	Total
	Single	twins		Vaginal delivery	Cesarean delivery	Vaginal delivery	Cesarean delivery		
	26	3		3	2	7	10		
Total	29 (58%)		7/29 (24%)	5/29 (17%)		17/29 (59%)		22/29 (76%)	29

Table (2): Reproductive outcome in all cases after operative hysteroscopy

Table 2 shows the reproductive outcome in all participants was as follows: 29 women out of 50 (58%) achieved pregnancy. Of those, 26 women (52%) had singleton pregnancies while 3 women (6%) had twin pregnancies. Of the 29 patients who achieved pregnancy, 7 patients (24%) aborted, 17 patients (59%) continued to term pregnancy and 5 patients (17%) had preterm delivery.

Type of pathology	Conception group (%)	No conception group (%)	Total number of patients in the group
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Septum	6 (54.5%)	5	11
Myoma	5 (50 %)	5	10
Polyps	14 (66%)	7	21
Polyps and myoma	4 (50%)	4	8
Total	29 (58%)	21	50

Table (3): Pregnancy rates in patients according to type of pathology

Table 3 shows pregnancy rates according to each pathology type; best results were achieved in women for whom polypectomy was done (66% of all participants), followed by metroplasty for incomplete intrauterine septum (pregnancy rate was 54.5%), then polypectomy and myomectomy for polyps' concomitant with myoma (pregnancy rate 50%) and finally myomectomy for fibroids (50%).

Table (4): Reproductive outcome in patients according to type of pathology

Type of pathology	Pregnancies	Abortions	Preterm deliveries	term deliveries	Live births	No reproductive improvement	Total	Statistical test*
Septum	6 (54.5%)	1	0	5	5(45.5%)	5	11	$\chi^2=0.260$ $p=0.967$
Myoma	5 (50 %)	2	1	2	3(30%)	5	10	$\chi^2=1.014$ $p=0.798$
Polyps	14 (66%)	2	2	10	12(57%)	7	21	$\chi^2=1.983$ $p=0.576$
Polyps and myoma	4 (50%)	2	1	1	2(25%)	4	8	$\chi^2=2.342$ $p=0.504$
Total	29 (58%)	6	5	17	22(44%)	21	50	

*; Each pathology was compared with rest of study population (df=3)

According to table 4 live births occurred mostly in polypectomy group which was (57%) 12 patients out of 21, while live birth rate was (45.5%) (n=5 of 11) in patients for whom resection for uterine septum has been done. But it was (30%) n=3 of the 5 patients with uterine fibroids for whom hysteroscopic myomectomy was done. And only in 2 patients of the 8 patients (25%) who underwent hysteroscopic myomectomy and polypectomy for both uterine fibroids and polyps respectively.

Table (5): Distribution of patients relieved from chief complains according to type of pathology

Type of pathology	Patients relieved group (%)	Patients Not relieved from symptoms	Total number of patients in the group	Statistical test*
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Septum	8 (72.7%)	3	11	$\chi^2=0.035$ $p=0.851$
Myoma	7 (70 %)	3	10	$\chi^2= 0.201$ $p= 0.654$
Polyps	17 (81%)	4	21	$\chi^2= 0.475$ $p= 0.490$
Polyps and myoma	6 (75%)	2	8	$\chi^2= 0.052$ $p= 0.820$

*; Each pathology was compared with rest of study population (df=1)

Table 5 shows distribution of patients relieved from main complaints according to type of intrauterine pathology; polyps group comes in the first place with relief rate 81%, while treated intrauterine fibroids a rate of 70% relief.

Table (6): Distribution of treatment results according to chief complaints

Chief complain	Conception group (%)	abortion	Preterm labor	Term pregnancy	Live births	Total number of patients in the group	Statistical test*
Infertility	9(60%)	2	2	5	7(47%)	15	$\chi^2=0.229$ $p=0.973$
Infertility & AUB	11(65%)	2	3	6	9(53%)	17	$\chi^2=1.345$ $p=0.718$
Infertility & Dysmenorrhea	6(75%)	1	0	5	5(62.5%)	8	$\chi^2=2.267$ $p=0.519$
Infertility & AUB & Dysmenorrhea	3(33%)	2	0	1	1(11%)	9	$\chi^2=3.449$ $p=0.327$
Infertility & hypomenorrhea	0	0	0	0	0	1	-
Total	29(58%)	7	5	17	22(44%)	50	-

*; Each pathology was compared with rest of study population (df=3)

Table 6 show distribution of treatment results according to chief complaints; Best results achieved in AUB group with pregnancy rate up to (65%) n=11 of 17 patients in the group, they gave 9 live births which was 41% of live births of the entire study.

Chief complain	Patients relieved group (%)	Patients Not relieved from symptoms	Total number of patients in the group
AUB	13(76.5%)	4	17
Dysmenorrhea	7(87.5%)	1	8
AUB & Dysmenorrhea	7(77.7%)	2	9
Hypomenorrhea	1(100%)	0	1

Table (7): Distribution of patients relieved from associated complains rather than infertility

According to Table 7 which show distribution of patients relieved from associated complaints rather than infertility, best results were achieved with AUB group, 13 patients out of 17 relieved from the main complaints i.e. AUB (76%).

Discussion

In current study, fifty patients, who have been met the requirements of the inclusion and exclusion criteria, participated prospectively in this study to evaluate the impact of detected and treated uterine and cervical abnormalities on the pregnancy rate and reproductive outcome. All women in reproductive age suffered from primary infertility for at least 1 year (range: 1–5 years). The mean period of follow-up was 15.51 ± 8.2 months (range: 3–24 months). The mean time required to get pregnant was 8.59 ± 3.4 months (range: 3–16 months). They underwent operative hysteroscopy for resection of submucous myoma, polypectomy or resection of intrauterine septum. All operations were performed during the mid-follicular phase of the menstrual cycle.

Even though hysteroscopy is a very accurate way to diagnose, it is hard to tell the difference between the uterine septum, the uterus bicornis, and the saddle-shaped uterus, which can lead to a wrong diagnosis. But the combination of hysteroscopy and laparoscopy, which is the gold standard for uterine septum diagnosis, raised the accuracy of uterine septum diagnosis to 100%. 9 Complete medical history, and physical examination including; general, abdominal and pelvic examinations were done. Routine laboratory evaluations, hormonal assay and semen analysis for husbands have been carried out. All patients underwent U/S, 20 underwent HSG, and 15 underwent saline infusion sonography.

For about one year in this study we advocated the use of operative hysteroscopic septoplasty, polypectomy and myomectomy for uterine septum, polyps and fibroids respectively in patients with primary infertility prior to any infertility treatment in general and assisted reproductive therapy as well, we compared the treatment results of each pathology treated to those of other pathologies in the whole group. The data in our study suggest that hysteroscopic septoplasty, polypectomy and myomectomy, for accessible uterine lesions in patients with primary infertility are beneficial prior to infertility treatment in general and IVF/ET as well. In addition, based on the results of full term, preterm and live birth rates and mean gestational age in pregnancy, again, it appears that the surgery is of benefit with respect obstetric outcome.

In our study the chief complaints which required indicated operative hysteroscopy were abnormal uterine bleeding (AUB) as well as infertility (34%) of patients, primary infertility alone was in 15 (30%) of patients. This is similar to that in other studies where abnormal uterine bleeding (AUB) and infertility were the most common indications for operative hysteroscopy.¹⁰ In a study done by Shazly et al.¹¹, Before hysteroscopic myomectomy, AUB was the main complaint, and after surgery, more than half of the women felt better.

In current study intrauterine polyps detected in more than 70% of patients with (AUB) and infertility were the main complains. Most of them were also cured of abnormal bleeding from the uterus after hysteroscopy polypectomy. This is

similar to what Al-Ani et al.¹² found: that patients with abnormal uterine bleeding who respond well to this treatment most often have an endometrial polyp when they have a hysteroscopic exam. Also, Ludwin et al.¹³ found in their study that polypectomy had the best obstetrical outcome. This backs up the idea that small intrauterine lesions, like polyps, that make it hard for an embryo to grow have better outcomes after polypectomy.

In current study the reproductive outcome in all participants was as follows: twenty-nine women out of 50 (58%) achieved pregnancy. Of those, 26 women (52%) had singleton pregnancies while 3 women (6%) had twin pregnancies. Of the 29 patients who achieved pregnancy, 7 patients (24%) aborted, 17 patients (59%) continued to term pregnancy and 5 patients (17%) had preterm delivery. During the first year of follow up 85% of pregnancies occurred, with an average of 8.5 months between surgery and getting pregnant. Ekine et al.¹⁴ and others have also noticed this short delay in conception. It is strongly suggested that patients try to get pregnant as soon as possible after the procedure. In several studies improvement in fertility rate following hysteroscopic operations on endometrial polyps, intrauterine septum and/or uterine myoma has been observed. In Sahu et al.¹⁵ study 24% of patients became pregnant after hysteroscopic myomectomy, septum resection and polypectomy.

Citu et al.¹⁶ In a review of published case series, 47 percent of infertile patients became pregnant after hysteroscopy polypectomy, compared to 42 percent of infertile patients with normal endometrial cavities. Shokeir et al.¹⁷ suggested that women who can't get pregnant should always get a diagnostic hysteroscopy. This is because women with eumenorrhea and functional endometrial polyps, even if they are small, are likely to have trouble getting pregnant. Similarity in the present study after operative hysteroscopy the reproductive outcome is 29 out of 50 patients (58%) achieved pregnancy. Of those, 7 out of 29 patients (24%) aborted, and live birth rate was 22 (76%).

According to type of pathology in the study, after hysteroscopic metroplasty which had been done for 11 patients with intrauterine septum 6 patients had pregnancy (54.5%), of which 1 had abortion and 5 had term pregnancy (45.5%). Among the 10 patients with uterine myoma for whom hysteroscopic myomectomy done, 5 patients 50% achieved pregnancy, 3 (30%) had live births while abortion occurred in 2 patients (20%). Best results had been achieved in the 21 women with intrauterine polyps as 14 (66%) achieved pregnancy of which 12 patients (57%) had live births. The pregnancy rate in patients with diagnosed polyps' concomitant with myoma was (50%) 2 patients out of 4 after polypectomy and myomectomy, one of them (25%) had term pregnancy, improvement of AUB occurred in 76.5% of patients with AUB

Results in current study are similar to those obtained by Atta Allah et al.¹⁸ who said that 13 out of 20 women who had hysteroscopy metroplasty became pregnant (65%), 4 had abortions, and 9 had full-term pregnancies? (45 percent). 25% of women who had a myomectomy got pregnant (4 out of 16 patients). And 62% of patients with abnormal uterine bleeding were improved. In current study after hysteroscopic metroplasty for uterine septum 6 patients of 11 achieved pregnancies (54.5%), 1/11 (0.9%) had abortion and 5/11 had term delivery

(45.5%). While 8 patients of 11 (72.7%) improved completely from associated symptoms (AUB, dysmenorrhea and/or hypomenorrhea). These results, regarding pregnancy rate, are similar to those of a study done by Tonguc et al.¹⁹, in which pregnancy rate was (58%) (18 of 31 patients) underwent hysteroscopic resection of uterine septum), live births rate in the same study was (55%).

In a study, Women with a septated uterus and primary infertility that couldn't be explained by anything else were studied to see how hysteroscopic metroplasty affected their ability to have children. 25 (41%) of the 61 women who had hysteroscopic metroplasty became pregnant between 8 and 14 months (mean: 11.2) after the surgery. Of those, 18 (29.5% of the whole group) gave birth to live babies (13 made it to full term and 5 were born early), and 7 (11.5% of the whole group) had spontaneous abortions. 20 Those results were similar to what was found in this study. In our study Twenty-one patients (42%) had endometrial polyps ranging in size from 0.5 to 3 cm. Of these, 13 patients had multiple polyps (eight patients had two polyps, three had three polyps and 2 patients had more than three polyps). All polyps were excised during hysteroscopy.

In our study, the best obstetric outcome was seen with polypectomy. This supported the idea that small intrauterine lesions, like polyps, that make it hard for an embryo to grow have better outcomes after polypectomy. 21 In our study, more than 81 percent of patients with polyp pathology and abnormal uterine bleeding were cured after hysteroscopy polypectomy. Similar to Lasmar's study, endometrial polyp is the most common hysteroscopic finding in patients with abnormal uterine bleeding who respond well to this treatment. 22

Conclusions

To conclude, our findings suggest that correction of any uterine abnormalities even if small and minor improves the chance of conception in infertile women who have no other causes for infertility. The results showed that operative hysteroscopy for resection of uterine septa, myomectomy, and polypectomy will increase the chances of clinical pregnancy in women who are not able to have children on their own, but the evidence is not yet clear. So, it seems likely that operative hysteroscopy is a safe and effective way to help women with intrauterine lesions and a history of infertility get pregnant more often.

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