Hysteroscopy Findings in Failed IVF and its Influence on Pregnancy Outcome

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Abstract

Objective: To identify and analyze the abnormal hysteroscopic findings in women falling IVF and its effect on pregnancy outcome.

Material & Methods: A simple descriptive non-randomized study of 245 patients was conducted in king Hussein Medical Center. All patients of failed IVF were referred to routine hysteroscopy in our hysteroscopic unit with hysteroscopic finding has been identified and recorded. The patient’s age ranged from 20 to 38 years and duration of infertility ranged from 5-10 years. Informed consent was also taken from them prior to the study.

Results: Uterine cavity was normal in 75% of the cases. While Sixty one (25%) patients showed abnormal hysteroscopic findings of the cervical canal and uterine cavity (endometrium).

Intramural myoma: 26 cases, Endometrial polyp: 19 cases. Isthmic abnormalities were present in 2-3% (5 cases). Endometrial hyperplasia 3 cases. Intruterin adhesion (IUA), synechiae: 4 cases, Septate uterus 4 cases.

Conclusion: Patients with recurrent IVF embryo transfer failures should be reevaluated using hysteroscopy prior to further commencing IVF-embryo transfer cycles. Hysteroscopy is part of first-line exams in infertile woman regardless of age.

Key Words: Infertility – Uterine cavity – Diagnosis – Hysteroscopy - In vitro fertilization.

Introduction

THE successful pregnancy outcome of patients undergoing ovarian stimulation for in vitro fertilization (IVF) or related advanced reproductive technologies depends on several factors. Among these, embryo quality and intrauterine environment which plays a major role for the achievement and further continuation of pregnancy. It has been reported that an abnormal uterine finding occurs in approximately 50% of infertile women [1,2,3]. Due to this high prevalence, evaluation of uterine cavity is recommended to screen for fibroids, polyps, adhesions, and uterine mullerian abnormalities. These abnormalities are commonly considered to have a negative impact on pregnancy outcome [4,5,6]. Uterine evaluation is usually accomplished with the help of hysterosalpingogram (HSG) or hysteroscopy (HSC). Hysteroscopy is the gold standard procedure for uterine cavity exploration [1]. However, the World Health Organization (WHO) recommends hysterosalpingography (HSG) alone for management of infertile women [2]. The explanation for this discrepancy is that HSG provides information on tubal patency or blockage. Office hysteroscopy is only recommended by the WHO when clinical or complementary exams (ultrasound, HSG) suggest intrauterine abnormality [3] or after in vitro fertilization (IVF) failure [4]. Nevertheless, many specialists feel that hysteroscopy is a more accurate tool because of the high false-positive and falsenegative rates of intra uterine abnormality with HSG [4,6]. This explains why many specialists use hysteroscopy as a first-line routine exam for infertility patients regardless of guidelines. The aim of this retrospective study is to describe hysteroscopy findings in a population of 557 infertile patients.

Historically and till today, most of the clinicians prefer HSG as a first line approach to evaluate the intrauterine pathology in infertile patients, but it has been proven to have certain drawbacks. Studies by Wang et al. and Golan et al., reported HSG has a false positive rate of 15.6% and false negative rate of 35.4% [7,8,9]. Hysteroscopic evaluation of uterine cavity for women with infertility has recently become a routine procedure. Hysteroscopy also offers great assistance for the interpretation
of uncertain findings from other diagnostic methods. Further, it enables direct visualization of the cervical canal and uterine cavity, and increases the precision and accuracy in the diagnosis of intrauterine conditions. The main objective of the study is to assess the improvement in pregnancy outcome in patients scheduled to undergo IVF/other ART procedures by diagnosing and treating intrauterine abnormalities using hysteroscopy.

**Material and Methods**

A simple descriptive non-randomized study of 245 patients was conducted in King Hussein Medical Center between Jun 2009 to Jun 2010. Patient criteria for inclusion in the prospective observational arm of the study were: Infertility, female age of 38 years or younger, normal uterine cavity on hysterosalpingogram that was performed within 12 months before the couple’s first IVF attempt, history of 2 consecutive implantation failures despite the transfer of at least 1 good-quality embryo derived from fresh IVF cycles or from 1 fresh IVF and its subsequent frozen/thaw cycle, performance of hysteroscopy after the second implantation failure, decision for a new fresh IVF cycle, suitability for IVF/intracytoplasmic sperm injection (ICSI) treatment, and completion of the new fresh IVF cycle with performance of embryo transfer. Hysteroscopy was carried out at King Hussein Medical Center in middle of Amman in Jordan in theater under general anesthesia. All hysteroscopies were performed in early proliferative phase using 1.9mm miniature Karl Storz hysteroscope which has a 30° view with a 3mm Bettochi continuous flow sheath. The flow sheath has a maximum 5mm diameter with an incorporated 5 Fr working channel. Associated mechanical instruments used were grasping forceps with teeth and scissors. Uterine distention was accomplished with glycine and 80mmHg constant intrauterine pressure was maintained using an electronic pump (hysteromat). At the end of the procedure, a sample of endometrium was taken for histological evaluation by aspiration using 4mm cannula. The patients were discharged after 15-60min of the procedure and no further complications were observed.

**Results**

Uterine cavity was normal in 75% of the cases, while sixty one (25%) patients were showed abnormal hysteroscopic finding of the cervical canal and uterine cavity (endometrium) in most cases of failed IVF as shown in Table (1). Rates of abnormal findings increased more than 35-40% after 40 years-Risk of abnormal finding was multiplied by a factor of 1.2 every 5 years. Table (2) showed abnormal hysteroscopic finding of the cervical canal and uterine cavity (endometrium) intramural myoma: 26 cases IMAGE (1), Endometrial polyp: 19 cases, isthmic abnormalities were present in 2-

<table>
<thead>
<tr>
<th>Findings</th>
<th>N (245) women</th>
<th>%</th>
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<tbody>
<tr>
<td>Normal</td>
<td>184 women</td>
<td>75</td>
</tr>
<tr>
<td>Abnormal</td>
<td>61 women</td>
<td>25</td>
</tr>
</tbody>
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**Fig. (1): Intramural myoma**

**Fig. (2): A fibroid is a benign growth that may form inside and some times outside the uterus.**

3% (5 cases), Intraperitoneal adhesion (IUA) synechiae 4 cases, Septate uterus 4 cases and endometrial hyperplasia in 3 cases.

We found that first-line office hysteroscopy for infertility shows abnormal findings in 35% of woman.
Table (2): Abnormal hysteroscopic findings.

<table>
<thead>
<tr>
<th>N</th>
<th>Percentage</th>
<th>Abnormal Hysteroscopic findings</th>
</tr>
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<tbody>
<tr>
<td>26</td>
<td>42</td>
<td>Intramural myoma</td>
</tr>
<tr>
<td>19</td>
<td>31</td>
<td>Endometrial polyp</td>
</tr>
<tr>
<td>5</td>
<td>8</td>
<td>Isthmic abnormalities</td>
</tr>
<tr>
<td>4</td>
<td>7</td>
<td>Intrauterine adhesion</td>
</tr>
<tr>
<td>4</td>
<td>7</td>
<td>Uterine septum</td>
</tr>
<tr>
<td>3</td>
<td>5</td>
<td>Endometrial thickening</td>
</tr>
</tbody>
</table>

Fig. (3): During hysteroscopy, a thin, lighted tube is inserted into the uterus to view its lining. Some conditions also can be treated with instruments passed through the hysteroscope.

Fig. (4): This is a view through a hysteroscope during office hysteroscopy of the inside of a uterus with two fibroids (myomas) on the back wall. The upper portion of the photograph shows the top of the uterus, which is normal. Fibroids like this can cause severe cramping (dysmenorrhea), heavy menstrual periods (menorrhagia) and bleeding between periods (metrorrhagia). This was quickly and accurately diagnosed by hysteroscopy.

Discussion

Hysteroscopy remains the gold standard for the evaluation of the uterine cavity and for the detection and treatment of intrauterine lesions. All the range of cavitary pathology can be diagnosed with the application of the technique, treatment can be applied immediately, and, of most importance, specimens or directed biopsy specimens can be sent for histological examination.

Hysteroscopy were performed consecutively by a single-trained operator. All investigations were performed using a flexible minihysteroscope which provides high patient acceptance since it makes hysteroscopy a painless and well-tolerated procedure. However, symptoms, clinical examination, ultrasound findings, HSG or hormonal blood sampling results characteristics.

After fertilization, embryo transfer was performed on day 3 and the number of embryos transferred is kept constant in all patient groups. Luteal support was given by progesterone vaginal suppositories (Uterogestan Two weeks after embryo transfer, serum human chorionic gonadotropin (hCG) was measured for confirmation of pregnancy, and a diagnosis of clinical pregnancy was made after visualization of fetal heart pulsation four weeks later by transvaginal sonography (TVS), with homogeneous age distribution. Hysteroscopy were performed consecutively by a single-trained operator. All investigations were performed using a flexible minihysteroscope which provides high patient acceptance since it makes hysteroscopy a painless and well-tolerated procedure. However, symptoms, clinical examination, ultrasound findings, HSG or hormonal blood sampling results characteristics were not available in our population. Moreover, there was no control group of fertile women to compare our findings with. Patients were referred from many hospitals and private clinics, with no homogeneity in infertility investigations prior to hysteroscopy. Finally, the absence of video recording did not allow control of findings by a different operator. No possibility of re-evaluation of the findings represents an important weakness of this study. However, experience of the single operator who performed all hysteroscopies and the use of a standard report to record abnormal findings limit the impact of such a bias.

The previously published data show large ranges of abnormal finding rates from one study to another (7.2% to 64%) [7-16]. These differences could be explained by the type of hysteroscopic distension
medium and/or hysteroscopic technique used, modifying the surgeon’s perception of intrauterine filling defects [17]. Results could also be influenced by the characteristics of the population: Age of the population, hormonal status, ethnic factor, type of infertility (primary or secondary) and indications for hysteroscopy (infertility alone, association with clinical, echographic or hysterosalpingographic abnormalities, prior to IVF ect.).

Dicker et al., founded higher rates of abnormal findings in elderly women (above 40 years old). Abnormalities such as submucous myomas, endometrial hyperplasia, and polyps were more frequent in this population, while in younger patients other uterine lesions such as adhesions and tubal ostia occlusion were more common [7]. When comparing hysteroscopic abnormalities before and after 38 years of age, Magos et al. [13] did not show a significant difference (51% of abnormal finding before 38 years and 43% after, p=.38). This result might be explained by the high rate of endometritis in their population (17.2%), which was more frequently observed in younger woman.

Many studies describe the incidence of abnormal findings with hysteroscopy in infertile women or prior to IVF, but none give the proportion of these women who could benefit from an adapted treatment based on hysteroscopic findings. It is difficult to draw direct connections between hysteroscopic findings and benefits from a specific treatment based on these findings. Treatments for some abnormalities are suspected beneficial in infertile women. These are intrauterine adhesions, congenital uterine malformations, endometrial polyps, and uterine myomas [18]. Chronic endometrial inflammation and micropolyps have also been related to infertility and recurrent miscarriages [19].

It is not clear yet if abnormal hysteroscopic findings, by guiding infertility treatments, increase pregnancy rates. In our population we founded abnormal hysteroscopic findings in 40% of the infertile women, and 75% of these abnormalities could be related to infertility and benefit from a specific treatment. La Sala et al., suggest hysteroscopy as a routine exam in infertile woman because it would be economically advantageous, in regard to costs of assisted reproductive technology [20].

Conclusion:
Patients with recurrent IVF embryo transfer failures should also be reevaluated using hysteroscopy prior to further commencing IVF-embryo transfer cycles in order to increase the clinical pregnancy outcome. Hysteroscopy as part of first-line exams in infertile woman regardless of age.

References
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