Caspian J Reprod Med, 2015, 1(1): 31-34

Caspian Journal of Reproductive Medicine

Journal homepage: www.caspjrm.ir

Original article

Is hysteroscopy a routine investigation before assisted reproductive techniques?

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Received: 29 Sp 2014 Accepted: 8 Jan 2015

Abstract

Background: Infertility is a common problem as it is observed in 10 - 15% of couples to whom developing approaches for treatment is an issue of utmost importance. The aim of the current study was to determine the accuracy of diagnostic transvaginal ultrasongraphy (TVS) for the investigation of uterin pathologies in women before the application of assisted reproductive technique (ART).

Methods: In this observational, cross-sectional study, TVS and diagnostic hysteroscopy were performed consecutively on 100 infertile women, who were candidates for ART. All the findings of TVS were compared with hysteroscopic appearance of uterine cavity. The sensitivity, specificity, and positive and negative likelihood ratios were also calculated for diagnostic polyp and uterine anomalies.

Results: Polyp was detected through diagnosis hysteroscopy in 6 cases (6.0%), out of whom 4 were diagnosed by TVS. The sensitivity and specificity ratios with TVS, diagnosed for polyp, were 50.00% and 98.94%, respectively. In addition, the sensitivity and specificity ratios with TVS, diagnosed for uterine abnormalities were 27.78 % and 98.78%, respectively.

Conclusion: The researchers concluded that TVS allows for the diagnosis of polyp uterine in the most cases, but its sensitivity for diagnosis of uterine anomalies is low. Therefore, TVS is not useful technique, compared with hysteroscopy, in patients who are candidates for ART. Thus, hysteroscopy is highly recommended.

Keywords: Assisted reproductive techniques, Hysteroscopy, Transvaginal ultrasonography, Uterine pathology

Introduction

Nowadays, infertility is regarded as a common phonomenon, which can affect 10 to 15 percent of couples around the world (1-3). This could be due to uterine abnormality in 15 percent of women who seek treatment for infertility (4), and the treatment of these disorders may be crucial for the improvement of infertility management (5-7). Every anatomical or immunological disorder may result in infertility, among which the endometrium health is of a particular importance. The uterine abnormalities, which can affect the fertility, are: congenital malformations, leiomyomas, intrauterine adhesions, endometrial

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polyps, and chronic endometritis (8). There are three basic methods for the evaluation of endometrial cavity which are: hysterosalpingohraphy (HSG), transvaginal ultrasonography (TVS) or sonohysterography with saline, and hysteroscopy. The appropriate method to be applied for each patient depends on his/her situation. TVS is a safe, simple method, which does not require anesthesia and is free of such complications as bleeding and cramp (9, 10). On the other hand, the hysteroscopy is a gold standard diagnostic method, which may let the physicians obtain some samples for pathological assessments (8). Moreover, hysteroscopy is such an accurate method that can result in no false positive and false negative results such as HSG. It can be easily used in outpatient settings out and can also make it possible for physicians to treat the probable uterine abnormalities in women in an attempt to increase the success rate of ART (10).

Nowadays, hysteroscopy is an approach used for women who are candidates for assisted reproductive techniques (ART). This approach is particularly important as it can generally bring about minor complications although the side-effects of anesthesia, uterine perforation, bleeding and adverse effects of expanding fluid can not be ignored. It is worth mentioning that none of the previous studies reported guidelines, recommending the hysteroscopy as a routine method for the evaluation of infertile women (10). Therefore, this study was conducted to determine the accuracy of diagnostic TVS in the assessment of uterine pathologies in women before the application of ART.

Materials and Methods

This cross-sectional study was performed on 100 infertile women, who were candidates for ART, in the Infertility and Reproductive Health Research center in Babol, north of Iran. The study was in progress from September, 2012 to Febrary, 2013. The women with normal hysterosalpingogram (HSG) findings were chosen, and those with a history of diagnostic hysteroscopy in the last six months were excluded from the study. The age, weight, height, body mass index, the type of infertility (primary or secondary) and its duration, the possible causes of infertility, and the history of previous IVF treatment were all meticulously evaluated in patients under study. The initial hormonal and semen analyses and gynecological examinations were also performed for all the candidates. It must be stated that Hysteroscopy and TVS were performed by a single experienced gynecologist.

The TVS was performed by a 5 MHz probe Fokuda, within 7 to 13 cycle days of menstruation. During these seven days of a woman's cycle, the endometrium thickens as it is minor in size and can grow. The Polyp, leiomyoma, the shape and size of uterine, and the endometrial status were all diagnosed by TVS. On the same day, the enrolled patients underwent a thorough diagnostic and/or operative hysteroscopy in early follicular phase of their cycle. All the interventions were performed under normal anesthesia in a normal lithotomic position. After making a cervical dilatation of 5-9 millimeters, the researchers inserted an operative rigid hysteroscope (5 millimeter Olympus hysteroscope (A40211-A)) into the uterine cavity, and used a fiberoptic to have a perfect intrauterine view. They also utilized dextrose (5%) for the distention medium, which kept the distention pressure between 100-150 mmHg. The fluid balance was supervised continuously, and the timing of the procedure was maintained as concisely as possible. Submucosal myomas intrauterine adhesions and polyps were treated by a scissor and resectoscope during hysteroscopic evaluation procedure. The endometrial hyperplasia was also treated by dilation and curettage after hysteroscopy. Endometrial biopsies were also taken in the case of uterine cavity hypoplasia during hysteroscopy. The data obtained through hysteroscopy were thoroughly analyzed. All the patients were followed after hysteroscopy for possible side-effects. All hysteroscopy evaluations such as inflammation, bleeding, discharge, mucosal hypertrophy and polyp were carried out for the endocervical canal. The endometrium checking process also included such factors as: inflammation, bleeding, adhesion, hyperplasia, polyp, leiomyoma, and the shape and size of uterine.

All the statistical analyses were performed by SPSS version 15.0. The researchers had to use Chi-Square, Fisher, and Independent-Samples t-test, for the analysis of the data. The sensitivity, specificity, and positive and negative likelihood ratios positive and were also calculated for TVS, compared with those of hysteroscopy.

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Results

Demographic variables are shown in Table 1. The infertility was primary in 83% and secondary in 17% of cases. Male, female, mixed, and unknown factors were contributing factors for infertility with the ratios of 56%, 21%, 7%, and 16%, respectively. On the whole, out of the total candidates, 78.6% of female and mixed factor infertility cases had polycystic ovary. The frequency of findings for TVS and hysteroscopy are shown in Table 2. There were no statistically significant associations found between age, body mass index, the duration of infertility, and previous ART frequency between TVS and hysteroscopy. The sensitivity and specificity ratios with TVS, diagnosed for polyp, were 50.00% and 98.94%, respectively. In addition, the sensitivity and specificity ratios with TVS, diagnosed for uterine abnormalities, were 27.78 % and 98.78%, respectively (Table 3).

Table 1. Frequency distribution of age, body mass index (BMI), infertility duration, and previous ART frequency

Demographic criteria	Mean±SD
Age(yr)	30.24±5.9
BMI (kg/m²)	27.14±4.2
Infertility duration (month)	56.54±5.1
Previous ART	0.16±0.5

Table 2. Frequency distribution of transvaginal ultrasongraphy (TVS) and hysteroscopy findings

Finding		N	%
Polyp	Hysteroscopy	6	6
	TVS	4	4
Uterine anomalies	Hysteroscopy	18	18
	TVS	5	5

Discussion

The women with uterine abnormalities will experience less fertility, which can be worsened in case these problems are not solved. According to the results of this study, the TVS findings for abnormal intrauterine cases, and abnormal hysteroscopy cases were 9% and 24%, respectively.

The highest sensitivity rate of TVS was the one observed for polyps, with the ratio of 55%, whereas its specificity ratio remained over 98% for each finding including the uterine anomalies and the polyp. While the sensitivity ratios of TVS for uterine abnormalities were around 28%. This can demonstrate the notion that TVS, due to its low sensitivity, is not a useful method for the screening of uterine abnormalities in women, who are candidates for ART, but its high specificity helps the physicians to use it as a confirmatory diagnostic method.

In a research study conducted on infertile women, the women with infertility or recurrent abortions were evaluated through hysteroscopy. The results showed abnormal findings in 40 percent of women and there were no complications as a result, which is in line with the results of this study, but what clearly makes this study distinct is the rate of uterine abnormalities, which was 18 % only (13).

Shalev et al (14) reported that the sensitivity and specificity of TVS, when compared with those of hysteroscopy, were 100% and 96.3%, respectively. It is worth mentioning here that the specificity was also high in our study, which is congruous with that result, but the sensitivity was low.

The mean of 30 for age in this study is similar to that of the previous studies (10, 11), which excludes the role of age in determining the differences between the current study and other investigations of its type. The mean for infertility duration was 56 months, which is comparable and consistent with that of other studies (10, 11). However, the rate of previous ART procedures was 12 % in this study, whereas the rates of three times higher or more were reported by other studies (10). The frequency of primary infertility was 83 % in this study, which is in line with those of other

Table 3. Sensitivity, specificity, and positive and negative likelihood ratios of transvaginal ultrasongraphy (TVS) for diagnosis of uterine abnormalities

Finding	Sensitivity	Specificity	PPV	NPV
Polyp	50.00 (29-100)	98.94 (94.19-87.58)	75.00 (20.34-95.88)	96.88 (91.13-99.31)
Uterine anomalies	27.78 (9.80-63.47)	98.78 (93.37-99.80)	83.33 (36.10-97.24)	86.17 (77.51-92.42)

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studies (12, 13), but the rate of male-factor infertility (56%) in the current study is higher than those of the previous studies (12, 15), which is an issue in an urgent need for further investigations.

Conclusion

All in all, it can be concluded that although TVS can be used as a good method in the diagnosis of polyp of uterine in a lot of cases, whereas its sensitivity for diagnosis of uterine anomalies is low Therefore, Hysteroscopy is highly recommended for patients who are candidates for ART. Further investigations need to be carried out to evaluate the applicability of other diagnostic methods for uterine abnormalities in infertile women.

Acknowledgements

The authors acknowledge the assistance of Babol University of Medical Sciences for their support. We should also like to appreciate Iranian women for their participation in this study.

Conflict of interest

The authors declare that there are no conflicts of interest.

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