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Original Research Article

Hysteroscopic findings and intrauterine pathology treatment in Mexican infertile women

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ABSTRACT

Background: Hysteroscopy is a minimally invasive approach in gynecologic surgery and one of the main procedures performed on women undergoing fertility treatments. Intrauterine pathology negatively affects fertility by decreasing endometrial receptivity and embryo implantation success, and its prevalence has been reported between 19% and 62%. The aim of our study was to describe the hysteroscopic findings, prevalence of intrauterine pathology, the instruments used for the treatment of structural lesions in Mexican infertile women; and to compare the relationship of positive findings with the type of infertility.
Methods: This was a descriptive, cross-sectional study conducted at fertility clinic at a private hospital.
Results: We evaluated 191 hysteroscopies; the mean age of women was 35.5±3.2 years and the mean time of infertility 5.7±3.2 years. Primary infertility was the most prevalent (79.1%). In 118 cases (61.8%), uterine cavity abnormalities were diagnosed, the most frequent findings were: polyps (n=51, 26.7%), endometritis (n=30, 15.7%), fibroids (n=15, 7.6 %), synechiae (n=12, 6.5%), and müllerian anomalies (n=10, 5.3%). For structural pathology treatment, cold scissors and bipolar energy were used in 65.5% and 34.5%, respectively.
Conclusions: Overall intrauterine pathology prevalence in our study population was 61.8%. Cold scissors and bipolar energy were used for structural lesions treatment. When comparing the relationship of hysteroscopic findings, no statistically significant difference was found in the presence of positive findings, with the type of infertility.

Keywords: Hysteroscopy, Intrauterine pathology, Infertility

INTRODUCTION

Hysteroscopy is a diagnostic or therapeutic procedure which is the cornerstone of minimally invasive treatments in gynecology.

It consists of inserting a rigid or flexible endoscope through the cervical canal to the uterus, using distending media to allow complete visualization of endometrial cavity.[1-3]

The main indications for hysteroscopy are: abnormal uterine bleeding, infertility, recurrent pregnancy loss, endometrial thickening, structural pathology of the uterine cavity: polyps, fibroids, retained trophoblastic tissue or intrauterine devices; and absolute contraindications are: current pelvic infection and viable pregnancy.[4,5]

Infertility, categorized as a disease by the World Health Organization, is a critical component of reproductive health; historically has been defined by the failure to achieve a successful pregnancy after twelve months or more, of regular, unprotected sexual intercourse or due to an impairment of a person's capacity to reproduce either as an individual or with her/his partner.[6]

According to estimates made in a 2007 research, infertility affects 72.4 million couples around the world, and 40.5 million are undergoing some type of fertility treatment. In Mexico, it is reported that 17% of women of reproductive age suffer from infertility.[7,8]

Intrauterine pathology negatively affects fertility by decreasing endometrial receptivity and embryo implantation success. If ultrasound, sonohysterography and hysteroscopy are compared for the evaluation of structural intrauterine abnormalities, the sensitivity and specificity of each study are: 89% / 56%; 91.8% / 60% and 97.3%/92%, respectively.[9,10]

The prevalence of abnormal findings in the uterine cavity diagnosed by hysteroscopy in infertile women is reported between 19 to 62%.[11-13]

The aim of our study was to describe hysteroscopic findings, the frequency of alterations in the uterine cavity and the type of instrument used for treatment of structural lesions in a group of Mexican infertile women; and secondarily to compare the relationship of the positive findings in hysteroscopy with the type of infertility (primary and secondary).

METHODS

A descriptive and cross-sectional study of hysteroscopic findings among infertile women who attended the assisted reproduction clinic of the hospital between March and November 2021 was carried out.

Women who met the following criteria were included: reproductive age (between 18 and 45 years); diagnosis of primary or secondary infertility, and only those who underwent a first evaluation of the uterine cavity by hysteroscopy. Women with a previous hysteroscopic surgery were excluded and duplicate studies were eliminated as part of the follow-up.

Ethical approval was obtained by the Institutional Ethics Review Board of Medical Centre. A detailed explanation of the procedure was given and all participants provided written informed consent form before undergoing the examination.

Transvaginal ultrasound was performed in all patients for the initial evaluation of the uterus, ovaries and adnexa. All participants underwent diagnostic hysteroscopy under general anesthesia and in sterile conditions. Hysteroscopy was performed in the operating room, since office hysteroscopy is not available in the clinic. The registers were archived in the clinic's database.

All procedures were performed in the follicular phase (cycle day 7-12) with a rigid, 30º fore-oblique telescope (HOPKINS®), using a 5-mm outer diameter, double-flow sheath, and a 5 Fr operating channel, following the vaginoscopy access technique described by Bettocchi. The uterine cavity was expanded under hydrostatic pressure using physiological saline solution (0.9% NaCl) with a Hamou Endomat II® suction and irrigation pump (Karl Storz). We set a continuous flow control of 200 mL/min, the negative pressure suction at 0.2 bar and the positive pressure at 80-100 mmHg. Hysteroscopy was performed with a standard sequence, inspecting vagina, endocervical canal, uterine cavity, endometrium, and tubal ostia.

A high-intensity cold light source was used via a fiberoptic lead, and all procedures were monitored using an endocamera (Karl Storz), monitor, and recording system. During hysteroscopy, both the anterior and posterior uterine walls were thoroughly examined by passing the hysteroscope parallel to the endometrial surface to identify any surface irregularity. Findings were recorded using a standard report. The procedure was considered complete only when the entire uterine cavity and both tubal ostia were visualized.

Information obtained was documented in a data collection sheet in which the following were recorded: age, weight, height, body mass index, type and time of infertility, as well as the findings in each segment of the genital tract: vagina, cervix, uterine cavity and tubal ostia. Medical records were obtained, recorded, reviewed, and then data were tabulated and analyzed.

For their subsequent analysis, the variables were dichotomized, defining as "abnormal" the presence of any structural lesion in each of the segments, such as: stenosis, polyps, fibroids, synechiae, septa, as well as the endometrial appearance with hyperemia focal or diffuse (accentuated blood vessel accumulation at the periglandular level), strawberry aspect as a typical image of hyperemia (extensive hyperemic endometrium with a white central point that is localized and scattered throughout the cavity), stromal edema (pale and thickened endometrium in the proliferative phase) or micropolyps (<1 mm in size).

For analysis of findings at utero-tubal junction, dichotomization was carried out according to visual hysteroscopic evaluation of said region, defining the billateral occlusion as abnormal and the patency of at least one tube, as normal.

SPSS v.23 (IBM SPSS Statistics®, USA) program was used for statistical analysis. Data were described expressing the quantitative variables in means and standard deviations and the nominal ones in frequency and percentages. A comparison of normal and abnormal

hysteroscopic findings with the type of infertility was made, using the chi-square test and taking a *p* value <0.05 as statistically significant.

RESULTS

Participants characteristics

A total of 224 women met the inclusion criteria and were included in the study, 33 of them were excluded due to a previous hysteroscopic surgery, getting a total of 191 hysteroscopies for analysis.

Mean age of women was 35.5±3.2 years; the average body mass index was 25.4±3.0 and the duration of infertility ranged from 1 to 16 years, being average time 5.7±3.2 years (Table 1).

Table 1: Demographic characteristics.

Characteristics	
Age (years)	35.5±3.2
Time of infertility (years)	5.7±3.2
Type of infertility *n* (%)	
Primary	194 (79.1)
Secondary	52 (20.9)
Weight (kg)	62.7±7.7
Height (mt)	1.57±0.06
Body mass index	25.4±3.0

The most frequent type of infertility was primary with 79.1% (n=150), while secondary had a frequency of 20.9% (n=41) (Figure 1).

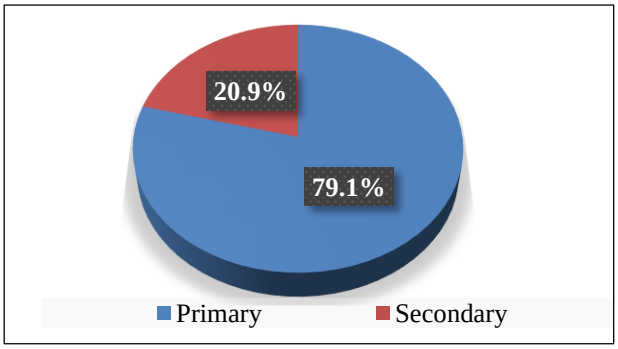

Figure 1: Frequency of primary and secondary infertility.

Hysteroscopic findings

Figure 2 shows the hysteroscopic findings in each segment of the genital tract: the prevalence of alterations in vagina, cervical canal, endometrial cavity, and tubal ostia was 0.5%, 26.2%, 61.8%, and 29.3%, respectively.

From 191 hysteroscopies, in 118 cases (61.8%), pathologic finding in the endometrial cavity was diagnosed (Figure 3), being the most frequent findings: polyps (n=51, 26.7%), chronic endometritis (n=30, 15.7%), fibroids (n=15, 7.6%), synechiae (n=12, 6.5%), and Müllerian anomalies (n=10, 5.3%) (Table 2). The rest of patients (n=73) had a normal hysteroscopic evaluation (38.2%) (Figure 4).

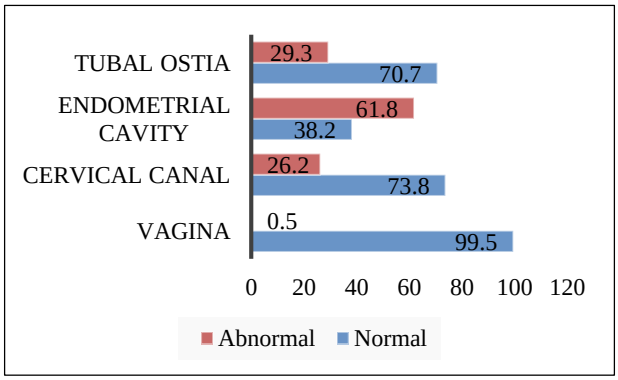

Figure 2: Normal and abnormal hysteroscopic findings in study population.

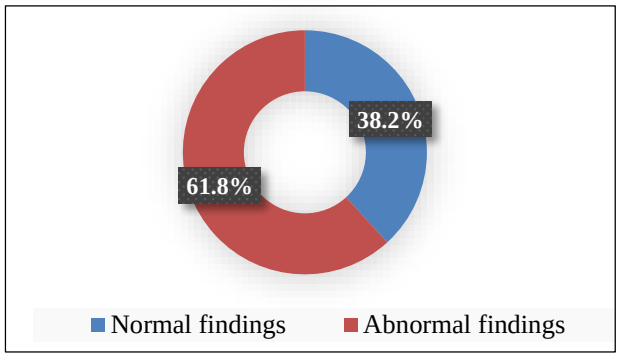

Figure 2: Prevalence of abnormal findings in endometrial cavity.

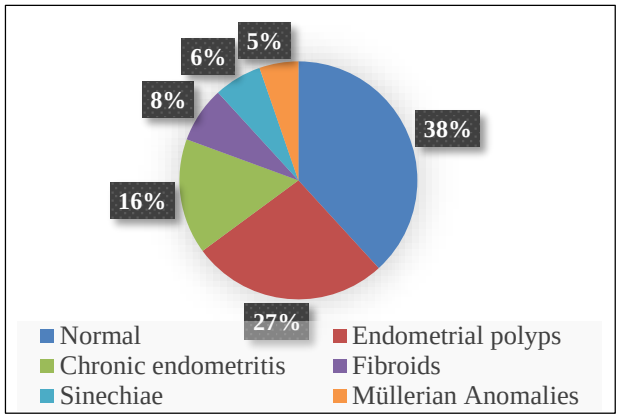

Figure 4: Prevalence and types of intrauterine pathology in study population.

Treatment of lesions

For structural lesions treatment of the uterine cavity, cold scissors were used in 65.5% and bipolar energy in 34.5% of the cases.

When comparing the relationship of findings in hysteroscopy, no statistically significant difference was found in the presence or absence of pathology, with the type of infertility (Table 2).

Table 2: Relation of hysteroscopic findings and type of infertility.

Hysteroscopic findings	Primary infertility, n (%)	Secondary infertility, n (%)	p value
Vagina			
Normal	150 (99.3)	40 (100)	0.60
Abnormal	1 (0.7)	0 (0)	
Cervical canal			
Normal	113 (74.8)	28 (70)	0.53
Abnormal	38 (25.2)	12 (30)	
Endometrial cavity			
Normal	56 (37.1)	17 (42.5)	0.53
Abnormal	95 (62.9)	23 (57.5)	
Tubal ostia			
Patent	111 (73.5)	24 (60)	0.09
Blocked	40 (26.5)	16 (40)	

DISCUSSION

In our study, the mean age of patients was 35.5±3.2 years, data similar to that reported by Koskas and Cosmin in 2010 and 2021, whose groups of women analyzed had a mean age of 35.3 and 34 years; but different from what was reported by Santi and Farag in 2012 and 2019, in whose study populations, the mean age of their infertility patients was slightly lower (33.8 and 32 years, respectively).[12,14-16]

The average time of infertility was 5.7±3.2 years; these results are comparable to those of other studies in Turkey, by Eskalen (4.5 years), but different from those reported by Farag: 7.6 years and by Ali: 2.8 years, in their researches on Egyptian women.[9,15,17]

In our analysis, primary infertility had a frequency of 79.1% and secondary infertility 20.9%, similar to data by several authors, where primary infertility was also more prevalent than secondary: Koskas (73.4% vs. 26.6%), El Huseiny (63.4% vs 36.5%), Farag (88% vs 12%), Citu (67.7% vs 32.3%), Ali (70% vs. 30%); unlike from the Pansky data, whose frequency of both types of infertility was similar (48% vs. 52%) and also different to that reported by Emeka, in whose study population in Nigerian women, secondary infertility was more frequent (20% vs. 80%).[7,11,12,14,15,17,18]

We found a global frequency of intracavitary pathology of 61.8%, similar to that described by Citu (63.1%), Farag (69.7%), Eskalen (76.8%) and Viveros (74%); the latter, also carried out in Mexican population. On the contrary, previously published data showed a lower overall frequency of alterations in the uterine cavity: Santi (17%), El Huseiny (20.4%), Ali (29%), Pansky (30%) and Koskas (40%).[9,11,12-15,17-19]

When carrying out the description of intracavitary findings in our study population, we found that polyps were the most prevalent pathology (26.7%), similar frequencies to those described by Emeka (22.5%) and Viveros (31%); emphasizing the possible mechanisms by which endometrial polyps could negatively affect fertility include: mechanical interference and release of molecules that negatively affect sperm transport or embryo implantation. Likewise, an elevation in glycodelin levels aromatase, inflammatory markers and reduced levels of messenger RNA HOXA-10 and HOXA-11 have been described; which are molecular markers associated with endometrial receptivity. On researches by El Huseiny, Pansky and Koskas, the prevalence of endometrial polyps was substantially lower (5.3%, 7.6% and 9.7%, respectively).[7,11,13,14,18,20-24]

The second most frequent pathology, with 15.7% was chronic endometritis, data similar to that described by Koskas (16%) in his description of hysteroscopic findings in French women, but different from that reported by other authors such as Citu, Farag and Emeka (0.5%, 0.8% and 1.2%, respectively). Although the gold standard for diagnosis of chronic endometritis is histological detection of plasma cells at the endometrial stroma, literature describes the high sensitivity and specificity (86.36% and 87.30%, respectively) of hysteroscopic diagnosis in the histological confirmation of chronic endometritis, with a diagnostic accuracy by this means of 93.4%, using criteria proposed by Cicinelli's group in 2005: focal or diffuse endometrial hyperaemia: marked accumulation of blood vessels at periglandular level, with a white central point “strawberry appearance”, stromal edema (pale and thickened endometrium in the proliferative phase) and micropolyps (<1 mm).[7,12,14,15,25-29]

In order of frequency, fibroids were the third most prevalent intracavitary pathology in our population, with 7.6%; similar to data reported by Ali, Koskas and Farag (8%, 5.4% and 5.2%), but different from numbers reported by Viveros in Mexico (19%) and Emeka, in his study of Nigerian women (31%), figures consistent with the global epidemiology of myomatosis, which mentions a fibroids prevalence three times higher in black women than in other populations.[7,13,14,15,17,30]

Uterine synechiae were the fourth most prevalent pathology in our study, with a frequency of 6.5%, figures similar to those described by El Huseiny (6.4%), Farag (5.2%), Ali (4%), Viveros and Koskas (4% in both studies). Previous data contrast with that reported by Emeka, whom research described a synechiae prevalence of 22.5%, however it is noteworthy that, in this cross-sectional study, 90% of women had a previous history of surgical interventions in the uterine cavity (myomectomies, dilation and curettage, adherenciolisis; which leads us to believe that in the vast majority of these

women, the main risk factor for adhesions was present.[7,11,13-15,17,31]

Finally, Müllerian anomalies in our study population had a frequency of 5.3%, figures similar to those reported by Citu, Koskas, Farag, El Huseiny and Viveros (with prevalences of 3.5%, 3.5%, 6.8%, 6.9% and 8%). This is consistent with the global and national epidemiology of these pathologies in the infertile population, which usually ranges from 5.5% to 8%, being higher (up to 12.6%) in women with recurrent pregnancy loss.[11-15,32,33]

This study is subject to several limitations, the major limitation is associated with its descriptive design and sample size, which reduces the chances of finding significant relationships among measures. Consequently, despite the study population being a clearly defined group of women, confounding bias may still exist and may affect our conclusions. In this regard, large cohort and case-control studies are urgently needed in order to confirm our results in different women with primary or secondary infertility and intrauterine pathology.

CONCLUSION

Frequency of abnormal uterine cavity findings in our study of infertile Mexican women was 61.8%, being the most prevalent pathologies: polyps (26.7%), chronic endometritis (15.7%), fibroids (7.6%), synechiae (6.5%) and Müllerian anomalies (5.3%). For the resection of structural lesions, cold scissors was used in 65.5% of the cases and bipolar energy in the rest (34.5%).

When comparing the relationship of hysteroscopic findings, no statistically significant difference was found between the presence or absence of pathology, with the type of infertility (primary or secondary).

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