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Analysis of the routine of medical specialists in hysteroscopies

Marina Martinelli **Sonnenfeld** *, Thomas **Moscovitz**, Roberta Ferraz Salles **Kesselring**, César Eduardo **Fernandes**, Marcos **Tcherniakovsky**

Department of Gynecology, Faculty of Medicine of ABC, Santo André, Brazil.

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***Corresponding author:** Marina Martinelli **Sonnenfeld**, MSc. Department of Gynecology, Faculty of Medicine of ABC, Avenida Lauro Gomes 2000, Santo André, Brazil.
Email: masonnenfeld.ms@gmail.com.
ORCID: 0000-0001-9415-0306.

ABSTRACT

Objective. To analyse the routine and surgical techniques of hysteroscopy specialists worldwide.

Materials and Methods. Cross-sectional observational study conducted at the Department of Gynecological Endoscopy at the University Center of the ABC Medical School. All data were collected using online virtual questionnaires. Medical professionals were asked several questions about their hysteroscopic routine, materials available, uterine pathologies treated, and any complications.

Results. A total of 237 questionnaires were answered by doctors from 16 countries. Most respondents (81%) were Brazilian and had more than 15 years of experience in hysteroscopies (45.6%). The average number of days per week dedicated to surgical hysteroscopy (1.8) was higher than the average number of days dedicated to outpatient hysteroscopy (1.3). In 27.3% of cases, the interviewee reported having already observed uterine perforation with electrical energy, and in 73.8% of cases the perforation occurred during the removal of uterine myoma, while in 69.2% the perforation occurred in the uterine wall. Among the doctors who reported having had a perforation with electrical energy, 53.8% interrupted the procedure and the patient remained hospitalized, under observation, while 35.4% interrupted the procedure and performed a laparotomy or laparoscopy. There was a statistical correlation between the number of cases of uterine perforation using electrical energy and experience of over 15 years in hysteroscopy ($p = 0.0011$).

Conclusions. The study highlights the need to learn more about doctors who perform hysteroscopies, exchanging experiences, and promoting improvements in each service. Specific points that would benefit from institutional protocols could also be analysed.

INTRODUCTION

The era of hysteroscopy has revolutionized modern gynaecology, providing patients with effective, resolutive procedures, with direct visualization of intrauterine alterations, which can be performed safely on an outpatient basis [1, 2]. Although this technology offers advantages over conventional surgery [3-6], such as reduced intraoperative bleeding and preservation of fertility, it is known

that the choice of surgical route depends on several factors: the extent of the anomaly, the doctor's technical skills and experience, the patient's wish to conceive and her clinical conditions, as well as availability of equipment [7-9]. Thus, approaches vary widely among those who apply outpatient or surgical hysteroscopy in their routine [10-12].

The first described hysteroscopy was performed in 1894 and, since then, it has become widespread throughout the world. According to a survey carried out in 2020, with projections until 2028, North America was found to have the largest data on hysteroscopies during the period analysed, accounting for 38.72% of the procedures, thanks to favourable regulations and reimbursement policies [13]. The research predicts that this supremacy will shift to Asia Pacific in the future, due to the region's larger population, as well as great prospect for implementing technology measures in local healthcare. In spite of low availability, the literature shows that hysteroscopy is feasible, safe, and effective even in environments with limited resources, and efforts should be made to train professionals and acquire equipment, especially for the management of infertility [1, 13, 14]. The procedure can be performed surgically or on an outpatient basis, with or without the need for narcosis. The possible surgical procedures described by the Practice Guidelines Committee of the American Association of Gynecologic Laparoscopists (AAGL) include endometrial biopsy, polypectomy, myomectomy, excision of adhesions, approach to Mullerian malformations, removal of foreign bodies, retained products of conception or poorly positioned intrauterine devices, approach to isthmocele, and clinical investigations into abnormal uterine bleeding, endometrial thickening during reproductive age or post-menopause, suspected malignancy, or infertility investigations [15-25].

Outpatient hysteroscopy is an alternative worth considering. It is cost-effective as it does not require hospitalization, precludes the need for general anaesthesia, facilitates office-based diagnosis and treatment, and is an intervention with a high patient satisfaction rate [26]. On the other hand, surgical hysteroscopy would ideally be intended for more complex cases, with a complication rate of up to 3%, considering cases of haemorrhage, intrauterine perforations with or without the use of electrical energy, cervical lacerations, and hydroelectrolytic imbalance caused by intravasation [27]. Considering the lack of studies evaluating the differences in clinical practice among professionals about performing hysteroscopies, this study aims to analyse the routine and surgical techniques of specialists worldwide.

Purpose

The main objective of this study is to evaluate the routine and surgical techniques of gynaecologists specializing in hysteroscopy worldwide (**Figure 1**) through an online questionnaire.

The secondary objective of this study is to compare what gynaecologists do in general with what the literature and protocols around the world recommend.

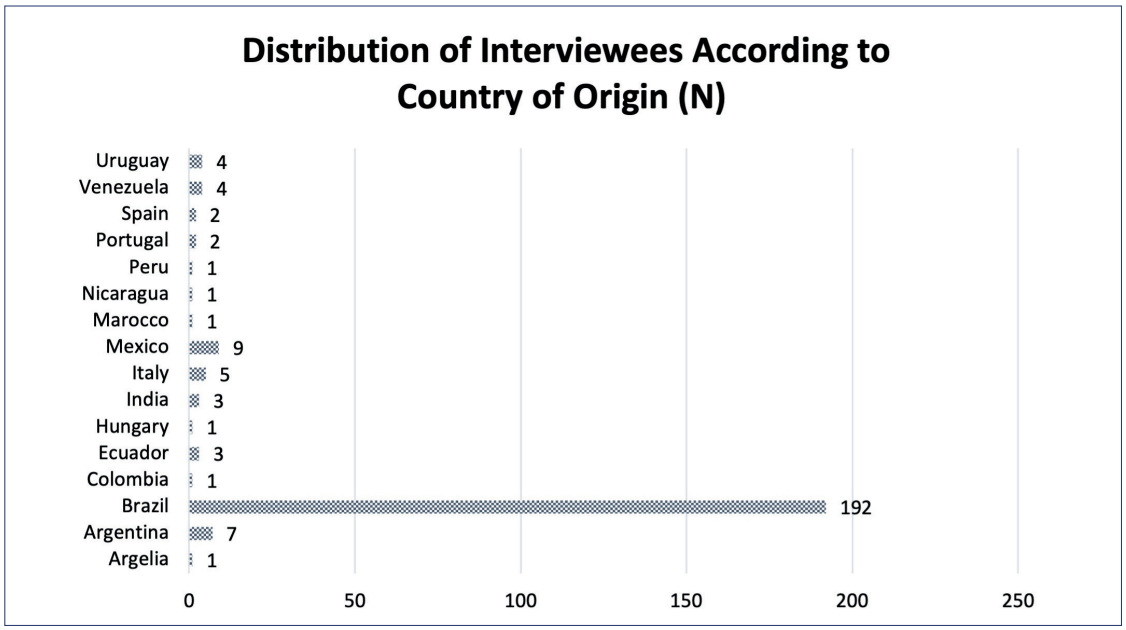

Figure 1. *Analysis of respondents according to country of origin.*

MATERIALS AND METHODS

Study design

This cross-sectional study was carried out by researchers from the Gynecological Endoscopy department of the Centro Universitário Faculdade de Medicina do ABC. All the data was collected on a standard virtual form created on the Google Forms platform.

Data collection

We evaluated the health professionals who received the survey link through WhatsApp and were willing to participate in it. Links to a Google Forms page, where initially participants had access to an informed consent form, were sent. If the participant agreed to the consent form and clicked on the option indicated, they received access to the questionnaire. Should they not agree to participate in the survey, it was terminated.

This study was carried out in accordance with the ethical principles of the Declaration of Helsinki. It was approved by the Research Ethics Committee of the FMABC University Center (CAAE No. 69002323.8.0000.0082).

Hysteroscopy Questionnaire Standard Form

Participants' clinical data was recorded, such as age, gender, city of work, and length of experience with hysteroscopies. The participants were asked whether they had their own video set and Bettocchi system, what their average number of surgical hysteroscopies (performed with a resectoscope in an operating room) per month was, and what the average number of days per week that the doctor performed surgical, or outpatient hysteroscopies (on average) was. The participants were also asked where they performed hysteroscopies, whether they used the "see and treat" technique, and whether they had ever performed an outpatient myomectomy with the Bettocchi system. If the answer to the last question was yes, they were asked if they would do it again, and if they had never done the procedure, they were asked why. They were also asked which procedures they felt able to perform with the Bettocchi system in an outpatient setting. In outpatient hysteroscopy with the Bettocchi system, we asked whether the professional used one or two working element sheaths (complete set) and whether the professional usually performed outpatient hysteroscopy with sedation. In the outpatient setting, they were asked about the most common outpatient approach for cases of cervical stenosis, as well as the determining factor for performing outpatient polypectomy in the opinion of the doctor evaluated. The question was asked whether the service where the professional performed hysteroscopy most often had a mini-resectoscope system available, whether the doctor had used this equipment, a hysteroscopic morcellator or a laser, and whether they would use it again. The participant answered what type of electrical energy and uterine distension medium – for outpatient and surgical hysteroscopies – they most often used, whether they had ever had a uterine perforation with electrical energy, what uterine pathology was being addressed in the case of perforation, what uterine wall was affected in this type of complication and what their response was. In the case of mechanical perforation, with a Hegar candle, we asked what uterine wall the doctor most often observed perforation in and what his or her action was. Finally, we asked whether the doctor performed outpatient hysteroscopy if the patient didn't bring any subsidiary tests, which technique in this case l most often (vaginoscopy, insertion of a Collins speculum) and whether the doctor performed vaginal examinations before carrying out the procedures.

Sample size and statistical analysis

This study included all the participants who met the selection criteria (convenience sample), with a total of 235 participants. The participants' characteristics were presented descriptively (minimum and maximum values, numbers, percentages, median and standard deviation). The data was distributed using the Kolmogorov-Smirnov test. Chi-square, Fisher's or Student's t-tests were used depending on the nature of the variables. If the data had a non-normal distribution, non-parametric tests were used. P-values < 0.05 were considered statistically significant. The data obtained was organized in Microsoft Excel® 2018 version 1910 spreadsheets (Microsoft Corporal®, San Diego USA).

Inclusion and exclusion criteria for research participants

Participants included gynaecologists with experience in hysteroscopies. Participants who did not agree to the informed consent form were excluded.

RESULTS

A total of 237 questionnaires from 16 countries were collected from doctors with an average age of 46.9 ± 11.6 years. Most respondents (81%) were Brazilian, while the second and third most present countries were Mexico (3.8%) and Argentina (3%), respectively.

Many doctors (45.6%) reported having more than 15 years' experience with hysteroscopies, and 38.4% reported having their own video set and Bettocchi system.

When evaluating the number of consultations per month, 62% of the professionals reported performing between 1 and 10 surgical hysteroscopies per month. On the other hand, when considering outpatient hysteroscopies, only 29.5% said that they performed the procedures with the same frequency, and 34.2% said that they did not perform outpatient hysteroscopy in their routine.

The average number of days per week dedicated to surgical hysteroscopy (1.8) was also higher than the average number of days dedicated to outpatient hysteroscopy (1.3). Most doctors (86.5%) reported performing the "see and treat" technique, and the majority of professionals performing outpatient hysteroscopy reported performing vaginoscopy (83%) instead of a Collins speculum insertion.

When asked where they performed hysteroscopies, 27.8% said that they performed them in a private practice, while the majority (72.4%) said that they only performed them in a hospital setting, including hospital outpatient clinics, and clinics for subsidiary exams. Among the professionals who performed hysteroscopies on an outpatient basis, 30.3% routinely performed the procedure with sedation, while 69.7% usually did the procedure without sedation.

Most professionals said they performed polypectomy on an outpatient basis (88.6%). The factors considered to be obstacles to carrying out the procedure on an outpatient basis are shown in **Figure 2**.

Only 34.1% of those assessed reported having already performed an outpatient myomectomy with the Bettocchi system, and in 13.6% of cases the doctor said he would not do the procedure again. Doctors who reported never having performed the procedure on an outpatient basis were analyzed individually. The majority (40.6%) felt that they did not have the necessary equipment, 39.1% did not think myomectomy should be performed on an outpatient basis (regardless of the size and number of fibroids), and 20.3% reported they did not think they had sufficient technical knowledge (**Figure 3**).

Among the professionals using the Bettocchi system in their routine, 50% reported using only the inner sheath and 50% reported using the associated external outer sheath.

With regards to complications, 88.6% of the correspondents had experienced mechanical uterine perforation, the most common site being the fundal wall (61.4%).

Among those interviewed, 27.43% reported incidence of perforation with electrical energy. This complication occurred in 73.8% of cases during the removal of a uterine myoma, and in 69.2% of cases

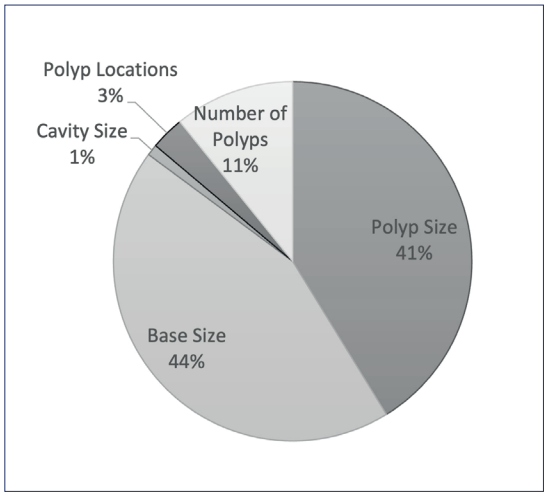

Figure 2. *Factors preventing outpatient polypectomy according to the opinion of the doctors interviewed.*

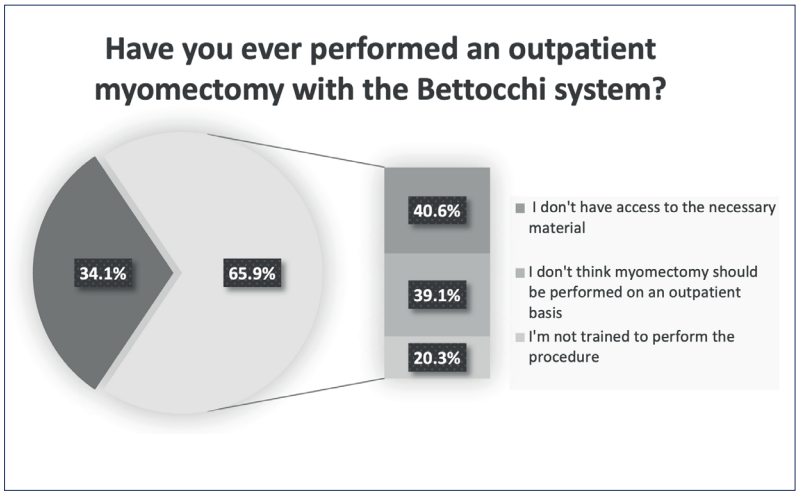

Figure 3. *Analysis of correspondents regarding outpatient myomectomy with the bettocchi system.*

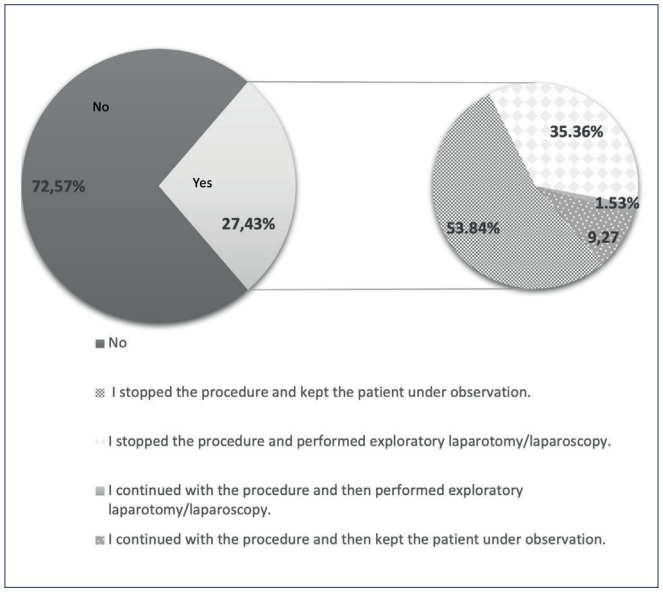

Figure 4. *Responses from correspondents when asked if they had ever detected uterine perforation with electrical energy.*

the perforation occurred in the fundal wall/fundic wall (**Figure 4**).

A statistical correlation was identified between incidence of perforation with electrical energy and experience in hysteroscopy ($p = 0.0011$) of over 15 years.

DISCUSSION

Despite the fact that outpatient hysteroscopy has many advantages over surgical hysteroscopy, such as the possibility of performing the procedure without anaesthesia, without the need for hospitalization, with faster recovery and a better cost-benefit ratio, the gynaecologists evaluated in this study expressed a preference for surgical hysteroscopy procedures in their routine [28-30]. Among the presumed barriers that render the outpatient procedure less attractive to physicians is the impression on the part of some professionals and patients that hysteroscopy is a painful and uncomfortable procedure when performed without anaesthesia [31-33]. In this study, a considerable proportion of hysteroscopists do not perform the procedure without anaesthesia, even in an outpatient setting. However, the literature shows that women generally tolerate hysteroscopy without analgesia, with an acceptance rate of over 80 [34]. In addition, advances in hysteroscopy, such as the reduction in the diameter of optics and surgical sheaths, as well as common sense about the benefits of vaginoscopy, reported by 83% of professionals, are factors that can mitigate the algic process. Among the risk factors for discomfort are women who have never had a vaginal delivery, women who have never been pregnant or who are in the post-menopausal period [35-41]. The same problem may be found among women with lower genital tract infections or cervical pathologies, obese women and women suffering from urogynaecological pathologies and women suffering from uterine localization of endometriosis [42-50]. It's also worth noting that the success of performing the procedure without anaesthesia will depend on the surgeon's skill [51]. Lack of technical training to perform outpatient procedures can also be a factor in whether or not a patient is referred to hospital for surgical hysteroscopy [52]. In fact, in this study, it was observed, for example, that more than 20% of the interviewees who reported not performing outpatient myomectomy with the Bettocchi system said they lacked adequate technical training to do so. How many hysteroscopies would be necessary for a professional to be considered an expert? According to a study by van Wessel et al, for example, doctors with experience covering 50 procedures or more were considered experts [53]. The Brazilian Federation of Gynecology and Obstetrics Associations states that doctors who can present evidence of having performed 80 hysteroscopic procedures are eligible to take the gynaecological endoscopy specialist exam [54]. However, the literature is not clear on the subject, especially when it comes to the division between outpatient and surgical hysteroscopies.

Another important factor for the low adherence to this type of intervention is the low coverage offered by medical insurances, which increases significantly if surgical hysteroscopy is performed in an operating room environment [55]. Outpatient hysteroscopy has a high level of accuracy in the diagnosis and treatment of endometrial polyps, and is considered the best option when cost- effectiveness of treatment is taken into account [56]. However, there is no guideline in the literature indicating when polypectomy should be performed on an outpatient basis or when a surgery centre setting would be a better alternative. The presence of this type of protocol would possibly standardize procedures and reduce the complication rates related to polypectomies performed with electrical energy. The study showed that the main contraindications for outpatient polypectomy by the participating doctors were related to the size of the base

(43.7%), followed by the size of the polyp (41.5%). It should be emphasized that the surgical procedure sometimes involves the need for cervical dilation and the use of energy on the uterine wall, which could be avoided, for example, in the case of patients trying to conceive [57]. According to Cholkeri-Singh A *et al.*, the incidence of uterine perforation is 0.13% in outpatient hysteroscopies and 0.12 to 1.6% in surgical hysteroscopies, which is extremely rare, despite being the most common event [52]. It is vital to reduce this risk by carrying out an adequate pre-procedure assessment, including anamnesis, physical examination – bimanual vaginal touch – and imaging tests. The main risk factors are: cervical stenosis, severe anteversoflexion of uterus or uterus in retroversoflexion, anatomical distortions and atrophic endometrium, and perforation occurs mainly during cervical dilation [58]. According to Cholkeri-Singh A *et al.*, the most commonly perforated site is the uterine fundus, a finding corroborated in this study, which found that 61.4% of perforations in the fundal wall of the uterus were made using mechanical energy / dilation with Hegar candles and 69.2% of perforations were made using electrical energy [52]. It is worth noting that bimanual touch was not described by 65% of the professionals who perform outpatient hysteroscopy in their practice [59].

When perforation occurs, the literature recommends that the procedure should be stopped immediately and, if the bleeding is small, caused by an injury during cervical dilation or by a blunt instrument without suction, the patient should be kept under observation. If the bleeding has increased or the perforation was caused by the use of a morcellator, suction device or electric current, laparotomy or exploratory laparoscopy should be performed due to suspicion of injury to adjacent organs or blood vessels [60]. Despite these guidelines, the study showed that a minority of the surgeons evaluated proceeded with laparotomy or laparoscopy when energy perforation was detected, which shows the urgent need for protocol standardization by international institutions. Finally, there was a statistical correlation between the number of cases of uterine perforation using electricity and experience with hysteroscopy ($p = 0.0011$) of over 15 years, demonstrating that the surgeon's expertise and practice are a determining factor in the success of the procedure without complications. Unfortunately, the study failed to assess the habits of hysteroscopists in relation to medically assisted procreation treatments. Although to date there are multiple techniques for obtaining good quality and quantity oocytes [61-64] or to select good sperm samples [63, 64], problems persist whose solution could be found within the uterine cavity [65-68].

Among the implications of the findings of this study for clinical practice and future research, it was evidenced that, although the literature demonstrates several benefits for performing outpatient hysteroscopy, most professionals refer their patients for surgical hysteroscopy. This type of information is relevant in the sense of joining efforts to make the environments of outpatient hysteroscopy and necessary materials more accessible to these professionals, also providing greater practicality to the user. Further studies would be needed in order to evaluate whether; despite having availability and material to perform outpatient hysteroscopy, these professionals still opt for hysteroscopy in the surgical environment and what would be the reasons for this statement.

This study has high social relevance because it addresses a topic that interferes with the uterine health of women, and may have repercussions on reproductive and menstrual patterns, with both gynaecological and obstetric impacts, being future comorbidities with high economic impact on the public health system. It is emphasized that there are still no large-scale studies analysing the routine of hysteroscopy specialists in the world. The study's potential weaknesses include the fact that it was a cross-sectional study with a single interview of the participants. Also, among the bias, it is included the possible memory bias of the interviewees- some of whom had more than 15 years of professional experience, and the fact that most of the participants were Brazilian; therefore, the findings could not be generalized to all the countries analysed. It is also noteworthy that this study was based on a questionnaire, and some questions asked to the participants sometimes had more than one answer – the professional, for example, may have had more than one situation of uterine perforation with energy, with different actions in each. Among the study's strengths, we highlight the large number of participants, involving surgeons from 16 countries. It is also important to emphasize that it was an opportunity for a valid and recommended exchange of experiences.

CONCLUSIONS

The study demonstrates the need to learn more about doctors who perform hysteroscopies, exchanging experiences and promoting improvements in each service. It was also possible to analyse specific points that would benefit from institutional protocols.

COMPLIANCE WITH ETHICAL STANDARDS

Authors' contributions
M.M.S.: Data curation, formal analysis, investigation, writing – original draft. T.M.: Conceptualization, data curation, formal analysis, investigation, methodology, project administration, writing – review & editing. R.F.S.K.: Data curation, writing – original draft, writing – review & editing. M.T.: Conceptualization, resources, supervision. C.E.F.: Conceptualization, resources.

Funding
None.

Study registration
N/A.

Disclosure of interests
The authors declare that they have no conflict of interests.

Ethical approval
The study was approved by the local ethics and research committee (CAAE 69002323.8.0000.0082).

Informed consent
All participants initiated the research only after agreeing to the ethics consent form.

Data sharing
Data are available under reasonable request to the corresponding author.

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