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Epidemiological profile of patients undergoing diagnostic hysteroscopy in a university hospital: a retrospective study

BÁRBARA MACHADO GARCIA[1], CAROLINA CARVALHO TOLENTINO[1], JÚLIA DE OLIVEIRA ABRAHÃO REIS[1], MARIA ANTÔNIA LOIOLA PACE[1], WALTER ANTÔNIO PRATA PACE[1]

[1]FACULDADE CIÊNCIAS MÉDICAS DE MINAS GERAIS – BELO HORIZONTE, MG-BRASIL
AUTOR PARA CORRESPONDÊNCIA: WALTER ANTÔNIO PRATA PACE – RUA FREI GONZAGA, Nº 125. BAIRRO: MANGABEIRAS– CEP: 30315-170- BELO HORIZONTE, MG- BRASIL. E-MAIL: WALTERAPPACE@GMAIL.COM

ABSTRACT

Introduction: Ambulatory hysteroscopy is a minimally invasive procedure that allows direct visualization of the uterine cavity. Currently, it is considered a gold standard diagnostic and therapeutic method for many intrauterine conditions. The epidemiological profile of patients undergoing this procedure is an important aspect to be studied. **Objective:** To construct an epidemiological profile of patients seen in a hysteroscopy service at a teaching hospital. **Method**: A retrospective cohort study aimed at analyzing epidemiological characteristics and hysteroscopic findings observed in patients who underwent examinations at a university hospital between 2011 and 2022. **Results:** A total of 3804 patients were included with an average age of 49.9 years. 44.6% were postmenopausal. The majority had some comorbidity (56%), with hypertension being the most common (39%). The main complaint was abnormal uterine bleeding (44%), followed by asymptomatic patients with an indication for endometrial research (43%). Regarding ultrasonography, 3235 examinations were documented. The main findings were endometrial thickening (40%) and polyps (33%). All patients underwent hysteroscopy, and 80% of them showed abnormalities on the exam, with 50% of them being polyps. Other conditions included endometrial thickening (19%), fibroids (12%), and cervical stenosis (11%). 394 biopsies were performed during hysteroscopy. 61% of them corresponded to polyps, and 15% suggestive of malignancy. **Conclusion:** It was possible to outline a consistent epidemiological profile of women undergoing ambulatory hysteroscopy in Brazil. The data are consistent with international literature on the subject. Hysteroscopy proved to be an efficient and conclusive method for investigating the uterine cavity.

Keywords: Hysteroscopy; Uterine Diseases; Epidemiology.

INTRODUCTION

The endometrial mucosa that lines the uterine cavity can undergo various anatomical and histopathological changes throughout life, both in the premenopausal and postmenopausal periods. These changes can be benign, such as endometrial polyps and submucosal leiomyomas; potentially malignant, such as endometrial hyperplasia; or outright malignant, such as endometrial carcinoma.[1] Furthermore, the uterine cavity may be evaluated in response to complaints such as infertility, which requires a direct analysis of the endometrial

mucosa and possible interventions in pathologies that interfere with the processes of fertilization, implantation, or the maintenance of pregnancy[2].
In this perspective, the search for methods with high specificity and sensitivity has led to the development of Hysteroscopy, the current gold standard for investigating the uterine cavity[3,4]. Its advantages over other methods, such as curettage, are primarily due to the possibility of confirming lesions identified visually through targeted biopsy. At the same time, it also allows for the "see and treat" approach, with the potential resolution of numerous conditions, from the diagnosis and treatment of polyps or leiomyomas to the removal of foreign bodies or products of abortion[5]. Thus, its current indications include abnormal uterine bleeding, suspicions of mass in the endometrial cavity, abnormal endometrial thickening, infertility or embryo implantation problems, intrauterine adhesions, among other suspicious abnormal findings in the uterine cavity[6].

Over the last decade, interest in the technique has led to significant investment in the development of flexible and small-diameter hysteroscopes, which allows for greater tolerability and safety during the procedure[7]. This is due to the elimination of the need for anesthesia or sedation, enabling the procedure to be implemented on an outpatient basis, bringing numerous benefits to patients and reducing costs in the healthcare system. This reduction is attributed to shorter hospital stays and the elimination of the invasive nature of transabdominal surgical approaches, commonly indicated previously[8].

Therefore, being a minimally invasive, low-cost procedure with high accuracy and thus greater patient satisfaction, gynecologists in clinical practice should be familiar with the use of hysteroscopy in the diagnosis and treatment of uterine pathologies [8,9]. Thus, given the importance of hysteroscopy nowadays and considering its potential for expansion in the investigation of intrauterine pathologies, this study sought to outline the epidemiological profile of women undergoing ambulatory hysteroscopy between 2011 and 2022. Through epidemiological and statistical analysis of the data obtained from patient records, the aim is to contribute to the establishment of the main complaints and indications for the procedure, correctly directing it, as well as identifying the main findings. Additionally, by characterizing the epidemiological profile of these patients, we aim to determine the demand within the Brazilian Unified Health System (SUS) for patients undergoing this examination.

In an epidemiological study involving 2675 patients undergoing hysteroscopy at a University Hospital in Greece, the main indications for the procedure were identified[10]. Common indications in the study population included abnormal uterine bleeding (n=819), sociographic evidence of polyps (n=322), subfertility (n=304), sonographic evidence of fibroids (n=277), recurrent miscarriages (n=202), menstrual cycle imbalance (n=154), and increased endometrial thickness (n=151). For women of reproductive age (n=2052), the most common indications were abnormal uterine bleeding, subfertility, and polyps. In menopausal women, the most common indications were abnormal uterine bleeding, increased endometrial thickness, and tamoxifen use.

Furthermore, a study with similar objectives and methods was published in 2019 by Costa, A. et al, outlining the epidemiological profile of patients undergoing surgical hysteroscopy in the region of Recife, Pernambuco, from 2018 to 2019. The study included a sample of 34 patients, with a mean age of 50 years. The main comorbidity found was systemic arterial hypertension (47.1% of patients), with a median number of pregnancies of 03 and parity of 02, of which 64.3% were natural births and 35.7% were cesarean sections.

The main finding of hysteroscopy was endometrial polyps, which were present in 64.7% of cases, followed by fibroids in 26.4%. However, the small sample size of the study is an important limitation.

With a significant sample size of patients, the present study has a goal to outline the epidemiological profile of patients undergoing hysteroscopy in Brazil. Thus, it aims to complement the current literature on this subject by addressing a sample of 3804, one of the most representative cohorts in the field of hysteroscopy, covering various subgroups undergoing the technique.

METHOD

Study Design

This is an observational, retrospective study of the cross-sectional cohort type, which was conducted based on data collection from the medical records of patients who underwent diagnostic hysteroscopy at a University Hospital. The medical records analyzed from January 2011 to November 2022.

The current hospital management software used by the hospital is the Tasy system, therefore, researchers with previous experience in using the system and trained to collect patient data were responsible for this stage of the study. Data collection took place at the medical clinic and the institution's library from January to June 2023. It is important to highlight that, prior to the start of data collection; the Research Ethics Committee (REC), under the CAAE, approved the present study: 61043622.3.0000.5134.

The sample included patients using the Unified Health System (SUS) who attended the teaching hospital for video-hysteroscopy examination. Research data will be collected from examinations performed by the Postgraduate Service in Minimally Invasive Gynecology at the hospital. The study included as participants women over 18 years of age who were referred for diagnostic hysteroscopy at the service. Pregnant patients and those with significant bleeding during the examination were among the exclusion criteria. Finally, medical records with incomplete data, with less than 80% of the data filled, were excluded. At this stage, 218 participants were left out of the study.

In the analyzed medical records, we collected the categorical variables of the patients included in the study, such as: age, status in the reproductive cycle, parity and type of birth delivery, main complaint, comorbidities, and previous surgeries. In addition, we had access to the results of ultrasounds performed prior to the hysteroscopy examination.

Regarding the hysteroscopy procedure, we had access to information on the indications for the exam, the results of the procedure, whether a biopsy was performed during the procedure, and the anatomopathological results.The patient's outcome was also documented, whether they were referred to a medical clinic, to surgical hysteroscopy, second look, discharge, among others. Therefore, to systematize data collection, a spreadsheet was created in Excel® and it was filled based on the patient's medical records.

Data Analysis

We entered all the collected information into an Excel® database, including the patient's admission number and corresponding data. For the data analysis methodology, categorical variables were presented as absolute and relative frequencies, while numerical variables were presented as mean ± standard deviation and/or median (1st quartile–3rd quartile). Numerical variables were subjected to the Anderson-Darling Normality test, and for mean comparisons, either t-test or Mann-Whitney test was used. To assess associations between categorical variables, either the Chi-square test or Fisher's Exact test was used. A significance level of 5% will be used, and the data were analyzed using R software, version 4.0.0

RESULTS

In this study, 3,804 female patients aged between 18 and 92 years were included. It is noteworthy that the estimated average age falls around 49.97 years with a standard deviation of 13.18 years. Among the participants, 76% of the women analyzed were between 34 and 65 years old, 10.2% were between 18 and 33 years old and only 3.3% were above 75 years old.

Additionally, 44.6% of the patients were postmenopausal, meaning they had not menstruated for 12 consecutive months. Regarding parity, the average number of children among participants who had children was 2.67. Most of them reported having between 3 and 5 children throughout their lives, representing 37% of the women included in the study. Furthermore, 34% had 1 or 2 children, with only 19% being nulliparous.

Most of patients (56%) had comorbidities. Among these women, the most common condition was arterial hypertension, affecting 70% of them. Other comorbidities included diabetes (23%), dyslipidemia (16%), and hypothyroidism (15%). Regarding lifestyle habits, 4.7% of women used tobacco throughout their lives, and 4.2% were or had been alcoholics throughout their lives.

The main complaint was abnormal uterine bleeding (44%). Thus, the term AUB refers to the group of women who presented bleeding that did not match their standard menstrual cycle, either intermenstrual bleeding or abnormal intensity during the menstrual period. Asymptomatic patients, but with indications for endometrial investigation, were also subjected to the examination (43%). Pelvic pain (13%) and infertility (9.2%), despite a relatively low prevalence, affected 492 and 345 women, respectively. Only a small percentage of complaints included other ultrasound findings such as possible uterine malformations (3.6%) or evaluation of an IUD in the cavity (2.7%).

Results of Ultrasound

During the study, 3,235 transvaginal ultrasound examinations were documented, with the results shown in Table 1. The most common uterine position was anteversion (89%). The most prevalent findings in the ultrasound examinations of the patients were visualization of endometrial thickening (40%), as well as identification of polyps in the cavity (33%). Regarding fibroids, 19% of the patients had submucosal fibroids and 16% had intramural fibroids.

Table 1: Data from ultrasound examinations provided by patients referred for hysteroscopy between 2011 and 2022

TOTAL	3,235 (100%)
Uterine position	
Anteverted	2,751 (89%)
Intermediate	12 (0.4%)
Retroverted	337 (11%)
Polyp	
NO	2,174 (67%)
YES	1,061 (33%)
Intramural fibroid	
NO	2,721 (84%)
YES	514 (16%)
Submucosal fibroid	
NO	2,607 (81%)
YES	628 (19%)
Adenomyosis	
NO	3,176 (98%)
YES	59 (1.8%)
Endometrial thickness	
NO	1,937 (60%)
YES	1,298 (40%)
Uterine Malformation	
NO	3,198 (99%)
YES	36 (1.1%)
Other findings	
NO	3,132 (97%)
YES	102 (3.2%)

Results of Hysteroscopy

All patients underwent hysteroscopy, and 81% of them showed alterations in the examinations, as demonstrated in Table 2. The most common finding was the presence of polyps in the cavity, affecting 50% of the patients. It was identified that 13.2% of the patients had fibroids during the examination. Only 12% of the participants showed endometrial thickening upon direct visualization, with 54 patients (1.5%) showing signs suggestive of malignancy.

Regarding cervical stenosis, 11% of the patients presented this finding. However, only 6% of all examinations were interrupted due to pain. Among the examinations interrupted due to pain, 82% of the patients presented cervical stenosis.

Regarding patient follow-up, 51% of the patients were discharged from hysteroscopy and outpatient follow-up was suggested. Additionally, 45% of the patients were referred for surgical hysteroscopy. In this case, the hysteroscopic finding that most led to this referral was the presence of polyps in the cavity. Finally, only 0.6% of the patients were referred to Oncology.

Biopsy Results

394 biopsies were performed during outpatient hysteroscopy. Regarding the results of histological analysis of the collected samples, 61% of them corresponded to polyps. Finally, only 15% of the biopsies had findings suggestive of malignancy related to endometrial cancer. The results are presented in Table 3.

Subgroup Analysis: Reproductive State X Menopausal State

The patients were divided into two groups: pre and post-menopause. These groups were compared using association tests: Chi-square test of independence, Wilcoxon rank-sum test, and Fisher's exact test. A total of 1,665 patients declared themselves to be in the menopausal state, i.e., without menstruation for 12 months, and 2,088 patients were in the pre-menopausal period (Table 4).

Table 2: Data of hysteroscopic findings of patients undergoing the examination between 2011 and 2022

Characteristics	N = 3,804
Normal	
NO	3,060 (81%)
YES	721 (19%)
Cervical stenosis	
NO	3,377 (89%)
YES	403 (11%)
Polyp	
NO	1,842 (50%)
YES	1,812 (50%)
Intramural fibroid	
NO	3,574 (98%)
YES	80 (2.2%)
Submucosal fibroid	
NO	3,268 (89%)
YES	386 (11%)
Uterine Malformation	
NO	3,617 (99%)
YES	37 (1.0%)
Signs of Endometritis	
NO	3,533 (97%)
YES	121 (3.3%)
Endometrial thickness	
NO	3,212 (88%)
YES	442 (12%)
Suggestive signs of malignancy	
NO	3,600 (99%)
YES	54 (1.5%)
Synechia	
NO	3,438 (94%)
YES	216 (5.9%)
Endometrial Atrophy	
NO	3,581 (98%)
YES	73 (2.0%)
Other findings	
NO	3,472 (95%)
YES	182 (5.0%)
Examination interrupted by pain	
NO	3,553 (94%)
YES	227 (6.0%)

Table 3: Data from histological analysis results of patients undergoing Hysteroscopy between 2011 and 2022

Biopsy in Diagnostic Hysteroscopy	
YES	394 (100%)
Polyp	
NO	154 (39%)
YES	240 (61%)
Endometritis	
NO	383 (97%)
YES	11 (2.8%)
Secretory Endometrium	
NO	367 (93%)
YES	27 (6.9%)
Proliferative Endometrium	
NO	363 (92%)
YES	31 (7.9%)
Biopsy suggestive of malignancy	
NO	334 (85%)
YES	60 (15%)
Leiomyoma	
NO	382 (97%)
YES	12 (3.0%)
Endometrial Hyperplasia	
NO	380 (96%)
YES	14 (3.6%)
Insufficient Material	
NO	381 (97%)
YES	13 (3.3%)
Other findings	
NO	378 (96%)
YES	16 (4.1%)

Table 4: Subgroup Analysis of Patients in Pre and Post-Menopausal States Attended in the Hysteroscopy Service between 2011 and 2022.

		MENOPAUSE		
Characteristics	**Total, N = 3,753[1]**	**NO, N = 2,088[1]**	**YES, N = 1,665[1]**	**p-value[2]**
Previous Uterine Surgery				0.800
NO	1,801 (49%)	1,006 (27%)	795 (21%)	
YES	1,904 (51%)	1,057 (29%)	847 (23%)	
Comorbidities				
Diabetes				**<0.001**
NO	3,211 (87%)	1,952 (53%)	1,259 (34%)	
YES	485 (13%)	102 (2.8%)	383 (10%)	
Hypertension				**<0.001**
NO	2,248 (61%)	1,655 (45%)	593 (16%)	
YES	1,448 (39%)	399 (11%)	1,049 (28%)	
Dyslipidemia				**<0.001**
NO	3,366 (91%)	1,992 (54%)	1,374 (37%)	
YES	330 (8.9%)	62 (1.7%)	268 (7.3%)	
Hypothyroidism				**<0.001**
NO	3,385 (92%)	1,946 (53%)	1,439 (39%)	
YES	311 (8.4%)	108 (2.9%)	203 (5.5%)	
Smoking				0.100
NO	3,350 (96%)	1,896 (54%)	1,454 (42%)	
YES	141 (4.0%)	70 (2.0%)	71 (2.0%)	
Alcoholism				**0.035**
NO	3,317 (96%)	1,856 (54%)	1,461 (42%)	
YES	150 (4.3%)	97 (2.8%)	53 (1.5%)	
Psychiatric disorders				0.500
NO	3,526 (95%)	1,964 (53%)	1,562 (42%)	
YES	170 (4.6%)	90 (2.4%)	80 (2.2%)	
Other comorbidities				**0.002**
NO	3,400 (92%)	1,916 (52%)	1,484 (40%)	
YES	295 (8.0%)	138 (3.7%)	157 (4.2%)	
Complaints				
Asymptomatic				**<0.001**
NO	2,122 (57%)	1,314 (35%)	808 (22%)	
YES	1,605 (43%)	755 (20%)	850 (23%)	
Pelvic Pain				>0.900
NO	3,239 (87%)	1,798 (48%)	1,441 (39%)	
YES	488 (13%)	271 (7.3%)	217 (5.8%)	

		MENOPAUSE		
Characteristics	**Total, N = 3,753[1]**	**NO, N = 2,088[1]**	**YES, N = 1,665[1]**	**p-value[2]**
Infertility				**<0.001**
NO	3,382 (91%)	1,726 (46%)	1,656 (44%)	
YES	345 (9.3%)	343 (9.2%)	2 (<0.1%)	
AUB				**<0.001**
NO	2,092 (56%)	1,022 (27%)	1,070 (29%)	
YES	1,635 (44%)	1,047 (28%)	588 (16%)	
Second Look				**<0.001**
NO	3,658 (98%)	2,014 (54%)	1,644 (44%)	
YES	69 (1.9%)	55 (1.5%)	14 (0.4%)	
IUD				**<0.001**
NO	3,628 (97%)	1,983 (53%)	1,645 (44%)	
YES	99 (2.7%)	86 (2.3%)	13 (0.3%)	
US FINDINGS				
Uterine Position				0.079
Anteverted	2,718 (89%)	1,487 (49%)	1,231 (40%)	
Intermediate	12 (0.4%)	4 (0.1%)	8 (0.3%)	
Retroverted	332 (11%)	165 (5.4%)	167 (5.5%)	
Endometrial thickness	8.1 (4.9, 12.0)	8.7 (4.9, 13.0)	7.9 (5.0, 11.2)	**<0.001**
Polyp				**<0.001**
NO	2,147 (67%)	1,001 (31%)	1,146 (36%)	
YES	1,047 (33%)	707 (22%)	340 (11%)	
Intramural fibroid				**<0.001**
NO	2,685 (84%)	1,375 (43%)	1,310 (41%)	
YES	509 (16%)	333 (10%)	176 (5.5%)	
Submucosal fibroid				**<0.001**
NO	2,576 (81%)	1,265 (40%)	1,311 (41%)	
YES	618 (19%)	443 (14%)	175 (5.5%)	
Adenomyosis				**<0.001**
NO	3,138 (98%)	1,664 (52%)	1,474 (46%)	
YES	56 (1.8%)	44 (1.4%)	12 (0.4%)	
Endometrial thickness				**<0.001**
NO	1,915 (60%)	1,453 (45%)	462 (14%)	
YES	1,279 (40%)	255 (8.0%)	1,024 (32%)	
Uterine Malformation				**<0.001**
NO	3,157 (99%)	1,675 (52%)	1,482 (46%)	
YES	36 (1.1%)	32 (1.0%)	4 (0.1%)	

		MENOPAUSE		
Characteristics	**Total, N = 3,753[1]**	**NO, N = 2,088[1]**	**YES, N = 1,665[1]**	**p-value[2]**
Other findings				**0.002**
NO	3,093 (97%)	1,638 (51%)	1,455 (46%)	
YES	100 (3.1%)	69 (2.2%)	31 (1.0%)	
HYSTEROSCOPY Normal				**<0.001**
NO	3,021 (81%)	1,533 (41%)	1,488 (40%)	
YES	710 (19%)	542 (15%)	168 (4.5%)	
Cervical Stenosis				**<0.001**
NO	3,330 (89%)	1,982 (53%)	1,348 (36%)	
YES	400 (11%)	93 (2.5%)	307 (8.2%)	
Polyp				**<0.001**
NO	1,818 (50%)	1,262 (35%)	556 (15%)	
YES	1,786 (50%)	782 (22%)	1,004 (28%)	
Intramural fibroid				**<0.001**
NO	3,526 (98%)	1,982 (55%)	1,544 (43%)	
YES	78 (2.2%)	62 (1.7%)	16 (0.4%)	
Submucosal fibroid				**<0.001**
NO	3,224 (89%)	1,758 (49%)	1,466 (41%)	
YES	380 (11%)	286 (7.9%)	94 (2.6%)	
Uterine Malformation				**<0.001**
NO	3,567 (99%)	2,012 (56%)	1,555 (43%)	
YES	37 (1.0%)	32 (0.9%)	5 (0.1%)	
Signs of Endometritis				**<0.001**
NO	3,483 (97%)	1,946 (54%)	1,537 (43%)	
YES	121 (3.4%)	98 (2.7%)	23 (0.6%)	
Endometrial thickness				**0.036**
NO	3,166 (88%)	1,816 (50%)	1,350 (37%)	
YES	438 (12%)	228 (6.3%)	210 (5.8%)	
Suggestive signs of malignancy				**<0.001**
NO	3,550 (99%)	2,038 (57%)	1,512 (42%)	
YES	54 (1.5%)	6 (0.2%)	48 (1.3%)	
Synechia				**<0.001**
NO	3,391 (94%)	1,947 (54%)	1,444 (40%)	
YES	213 (5.9%)	97 (2.7%)	116 (3.2%)	
Adenomyosis				**<0.001**
NO	3,541 (98%)	1,988 (55%)	1,553 (43%)	
YES	63 (1.7%)	56 (1.6%)	7 (0.2%)	
Endometrial Atrophy				**<0.001**

		MENOPAUSE		
Characteristics	**Total, N = 3,753[1]**	**NO, N = 2,088[1]**	**YES, N = 1,665[1]**	**p-value[2]**
NO	3,531 (98%)	2,019 (56%)	1,512 (42%)	
YES	73 (2.0%)	25 (0.7%)	48 (1.3%)	
Other findings				**0.017**
NO	3,425 (95%)	1,927 (53%)	1,498 (42%)	
YES	179 (5.0%)	117 (3.2%)	62 (1.7%)	
Exam interrupted by pain				**<0.001**
NO	3,503 (94%)	2,003 (54%)	1,500 (40%)	
YES	227 (6.1%)	72 (1.9%)	155 (4.2%)	
BIOPSY				
Polyp				0.140
NO	153 (40%)	73 (19%)	80 (21%)	
YES	234 (60%)	94 (24%)	140 (36%)	
Endometritis				0.200
NO	376 (97%)	160 (41%)	216 (56%)	
YES	11 (2.8%)	7 (1.8%)	4 (1.0%)	
Secretory Endometrium				**<0.001**
NO	360 (93%)	145 (37%)	215 (56%)	
YES	27 (7.0%)	22 (5.7%)	5 (1.3%)	
Proliferative Endometrium				**0.001**
NO	356 (92%)	145 (37%)	211 (55%)	
YES	31 (8.0%)	22 (5.7%)	9 (2.3%)	
Biopsy suggestive of malignancy				**<0.001**
NO	327 (84%)	156 (40%)	171 (44%)	
YES	60 (16%)	11 (2.8%)	49 (13%)	
Leiomyoma				0.500
NO	376 (97%)	161 (42%)	215 (56%)	
YES	11 (2.8%)	6 (1.6%)	5 (1.3%)	
Endometrial Hyperplasia				0.800
NO	374 (97%)	161 (42%)	213 (55%)	
YES	13 (3.4%)	6 (1.6%)	7 (1.8%)	
Other findings				>0.900
NO	371 (96%)	160 (41%)	211 (55%)	
YES	16 (4.1%)	7 (1.8%)	9 (2.3%)	
REFERRAL				
Second look				**<0.001**
NO	3,471 (95%)	1,887 (52%)	1,584 (43%)	
YES	191 (5.2%)	153 (4.2%)	38 (1.0%)	

		MENOPAUSE		
Characteristics	**Total, N = 3,753[1]**	**NO, N = 2,088[1]**	**YES, N = 1,665[1]**	**p-value[2]**
Surgical hysteroscopy				**<0.001**
NO	2,030 (55%)	1,287 (35%)	743 (20%)	
YES	1,632 (45%)	753 (21%)	879 (24%)	
Ambulatory				**<0.001**
NO	3,005 (82%)	1,582 (43%)	1,423 (39%)	
YES	657 (18%)	458 (13%)	199 (5.4%)	
Oncology				**<0.001**
NO	3,638 (99%)	2,038 (56%)	1,600 (44%)	
YES	24 (0.7%)	2 (<0.1%)	22 (0.6%)	
Gynecologic surgery				0.200
NO	3,611 (99%)	2,007 (55%)	1,604 (44%)	
YES	51 (1.4%)	33 (0.9%)	18 (0.5%)	
Medical discharge				**0.025**
NO	2,471 (67%)	1,345 (37%)	1,126 (31%)	
YES	1,191 (33%)	695 (19%)	496 (14%)	

[1]n (%); Median (IQR)

[2]Chi-square test of independence; Wilcoxon rank-sum test; Fisher's exact test

In relation to comorbidities, at the 0.05 significance level, significant associations were observed between menopause and pathologies such as DM, hypertension (HAS), dyslipidemia, and hypothyroidism. Regarding lifestyle habits, smoking did not show a significant association with any group. However, alcohol consumption was associated with pre-menopausal patients.

The main complaints varied significantly between the groups. Among the variables analyzed, only pelvic pain did not show a significant association with any group. Thus, post-menopausal patients were associated with asymptomatic conditions but received an indication for hysteroscopy due to endometrial thickening observed via ultrasound. On the other hand, pre-menopausal patients were associated with complaints of abnormal uterine bleeding, infertility, second-look examinations, analysis of intrauterine devices (IUDs) in the cavity, and other ultrasound findings, including conditions such as uterine malformations.

On ultrasound, the most common uterine position between both groups was anteversion. There was an association between smaller uterine volumes and menopause. Additionally, this group presented a significantly smaller endometrial thickness compared to the pre-menopausal group. Normal ultrasound examinations were associated with fertile-age patients. Furthermore, this group was also associated with findings of polyps, adenomyosis, and both submucosal and intramural fibroids on ultrasound. Patients who stated they had already gone through menopause were associated with the finding of endometrial thickening on ultrasound.

In hysteroscopy examinations, cervical stenosis was highly associated with post-menopausal patients along with interruptions of the examination due to pain, which may be related to this condition, as 188 out of 400 people with cervical stenosis had their examination interrupted due to pain. Moreover, other findings associated with this group included the pre-

sence of polyps in the cavity, synechiae, endometrial atrophy, endometrial thickening, and signs suggestive of malignancy.

On the other hand, the pre-menopausal group was associated with examinations where no abnormalities were found in the cavity, as well as with both intramural and submucosal fibroids. Additionally, the diagnosis of uterine malformations, adenomyosis, and endometritis was also associated with these patients.

At last, biopsies revealed an association between menopause and biopsies suggestive of malignancy, with this group having higher rates of referral to surgical hysteroscopy and oncology. Patients of fertile age were associated with histopathological analysis corresponding to secretory endometrium and proliferative endometrium.

Subgroup Analysis: Patients with Complaints of Abnormal Uterine Bleeding (AUB)

The patients were divided into two groups: those who presented with complaints of AUB during the anamnesis versus those who did not. These groups were compared using the association tests of Chi-square independence, Wilcoxon rank-sum test, and Fisher's exact test. 3768 patients with complaints of AUB were recorded, meaning they presented with bleeding from the uterine cavity with abnormalities in regularity, volume, frequency, or duration, in non-pregnant women.

Regarding comorbidities, at the 0.05 significance level, significant associations were observed between AUB and comorbidities such as smoking, alcohol consumption, and psychiatric disorders. As for complaints, significant associations were found for asymptomatic patients or those with complaints of pelvic pain and infertility. The need for a second look and the use of intrauterine devices (IUDs) also represented statistically relevant findings.

Regarding ultrasound (US), it was noted that most patients had a uterus in anteversion, followed by retroversion and intermediate position. As for volume, the total mean found was 85 cc. Normal findings on US were the most prevalent, representing 84.6% of the total patients with AUB. However, among the findings, submucosal fibroids, adenomyosis, and alterations in endometrial thickness were perceived as statistically significant associations for patients with AUB.

In hysteroscopy, cervical stenosis was also seen as significantly associated with the complaint of AUB, as well as intramural and submucosal fibroids, uterine malformations, endometrial thickening, signs suggestive of malignancy, and adenomyosis. Additionally, in the group of patients with AUB, there was statistical relevance in the finding of patients who had their examination interrupted due to pain. Of the 1644 patients with AUB, 78 needed to interrupt the examination due to pain, representing 4% of the total patients in the group.

Finally, in biopsy findings, polyps, secretory endometrium, and endometrial hyperplasia represented relevant and prevalent associations among patients with AUB. Of the patients with this complaint, 15% presented with polyps, 4.9% presented with secretory endometrium, and 2.8% with hyperplasia. Regarding biopsy findings indicative of malignancy, an important association was also noted, with 11% of patients with AUB presenting neoplastic findings on biopsy. The data are shown in the following table:

Table 5: Analysis of the subgroup of patients with the complaint of Abnormal Uterine Bleeding in relation to the other patients attended at the hysteroscopy service between 2011 and 2022.

	ABNORMAL UTERINE BLEEDING			
Characteristics	**Total**, N = 3,768[1]	**NO**, N = 2,112[1]	**YES**, N = 1,656[1]	**p-value**[2]
Menopause				<0.001
NO	2,069 (56%)	1,022 (27%)	1,047 (28%)	
YES	1,658 (44%)	1,070 (29%)	588 (16%)	
Previous Uterine Surgeries				0.500
NO	1,808 (49%)	1,000 (27%)	808 (22%)	
YES	1,912 (51%)	1,078 (29%)	834 (22%)	
Comorbidities				
Diabetes				0.700
NO	3,225 (87%)	1,803 (49%)	1,422 (38%)	
YES	487 (13%)	277 (7.5%)	210 (5.7%)	
Hypertension				0.200
NO	2,257 (61%)	1,283 (35%)	974 (26%)	
YES	1,455 (39%)	797 (21%)	658 (18%)	
Hypothyroidism				0.500
NO	3,397 (92%)	1,898 (51%)	1,499 (40%)	
YES	315 (8.5%)	182 (4.9%)	133 (3.6%)	
Smoking				**0.023**
NO	3,365 (96%)	1,902 (54%)	1,463 (42%)	
YES	139 (4.0%)	65 (1.9%)	74 (2.1%)	
Alcoholism				**0.004**
NO	3,330 (96%)	1,888 (54%)	1,442 (41%)	
YES	150 (4.3%)	67 (1.9%)	83 (2.4%)	
Psychiatric Disorders				**0.001**
NO	3,540 (95%)	2,004 (54%)	1,536 (41%)	
YES	172 (4.6%)	76 (2.0%)	96 (2.6%)	
COMPLAINTS				
Asymptomatic				**<0.001**
NO	2,145 (57%)	525 (14%)	1,620 (43%)	
YES	1,623 (43%)	1,587 (42%)	36 (1.0%)	
Pelvic Pain				**<0.001**
NO	3,276 (87%)	1,684 (45%)	1,592 (42%)	
YES	492 (13%)	428 (11%)	64 (1.7%)	
Infertility				**<0.001**
NO	3,423 (91%)	1,801 (48%)	1,622 (43%)	
YES	345 (9.2%)	311 (8.3%)	34 (0.9%)	
Second Look				**<0.001**
NO	3,699 (98%)	2,048 (54%)	1,651 (44%)	
YES	69 (1.8%)	64 (1.7%)	5 (0.1%)	
IUD				**<0.001**

NO	3,667 (97%)	2,024 (54%)	1,643 (44%)	
YES	101 (2.7%)	88 (2.3%)	13 (0.3%)	
US FINDINGS				
Uterine Position				0.300
Anteverted	2,730 (89%)	1,477 (48%)	1,253 (41%)	
Intermediate	12 (0.4%)	8 (0.3%)	4 (0.1%)	
Retroverted	336 (11%)	194 (6.3%)	142 (4.6%)	
Endometrial thickness	8.1 (5.0, 12.0)	7.5 (4.6, 11.0)	9.1 (5.4, 13.8)	**<0.001**
Polyp				0.400
NO	2,162 (67%)	1,193 (37%)	969 (30%)	
YES	1,050 (33%)	564 (18%)	486 (15%)	
Intramural fibroid				0.066
NO	2,702 (84%)	1,497 (47%)	1,205 (38%)	
YES	510 (16%)	260 (8.1%)	250 (7.8%)	
Submucosal fibroid				**<0.001**
NO	2,591 (81%)	1,504 (47%)	1,087 (34%)	
YES	621 (19%)	253 (7.9%)	368 (11%)	
Adenomyosis				**<0.001**
NO	3,154 (98%)	1,738 (54%)	1,416 (44%)	
YES	58 (1.8%)	19 (0.6%)	39 (1.2%)	
Endometrial thickness				**0.002**
NO	1,914 (60%)	1,005 (31%)	909 (28%)	
YES	1,298 (40%)	752 (23%)	546 (17%)	
Uterine Malformation				0.074
NO	3,175 (99%)	1,732 (54%)	1,443 (45%)	
YES	36 (1.1%)	25 (0.8%)	11 (0.3%)	
HYSTEROSCOPY				
Normal				**<0.001**
NO	3,035 (81%)	1,659 (44%)	1,376 (37%)	
YES	710 (19%)	441 (12%)	269 (7.2%)	
Cervical Stenosis				**<0.001**
NO	3,341 (89%)	1,828 (49%)	1,513 (40%)	
YES	403 (11%)	272 (7.3%)	131 (3.5%)	
Polyp				0.500
NO	1,821 (50%)	1,020 (28%)	801 (22%)	
YES	1,797 (50%)	987 (27%)	810 (22%)	
Intramural fibroid				**0.003**
NO	3,539 (98%)	1,976 (55%)	1,563 (43%)	
YES	79 (2.2%)	31 (0.9%)	48 (1.3%)	
Submucosal fibroid				**<0.001**
NO	3,237 (89%)	1,853 (51%)	1,384 (38%)	
YES	381 (11%)	154 (4.3%)	227 (6.3%)	
Uterine Malformation				**0.031**
NO	3,581 (99%)	1,980 (55%)	1,601 (44%)	

YES	37 (1.0%)	27 (0.7%)	10 (0.3%)	
Signs of Endometritis				0.300
NO	3,497 (97%)	1,946 (54%)	1,551 (43%)	
YES	121 (3.3%)	61 (1.7%)	60 (1.7%)	
Endometrial thickness				**<0.001**
NO	3,181 (88%)	1,807 (50%)	1,374 (38%)	
YES	437 (12%)	200 (5.5%)	237 (6.6%)	
Suggestive signs of malignancy				**<0.001**
NO	3,564 (99%)	1,992 (55%)	1,572 (43%)	
YES	54 (1.5%)	15 (0.4%)	39 (1.1%)	
Synechia				**<0.001**
NO	3,404 (94%)	1,846 (51%)	1,558 (43%)	
YES	214 (5.9%)	161 (4.4%)	53 (1.5%)	
Adenomyosis				**<0.001**
NO	3,555 (98%)	1,993 (55%)	1,562 (43%)	
YES	63 (1.7%)	14 (0.4%)	49 (1.4%)	
Exam interrupted by pain				**0.003**
NO	3,517 (94%)	1,951 (52%)	1,566 (42%)	
YES	227 (6.1%)	149 (4.0%)	78 (2.1%)	
BIOPSY				
Polyp				**0.015**
NO	152 (39%)	60 (15%)	92 (24%)	
YES	236 (61%)	123 (32%)	113 (29%)	
Endometritis				0.300
NO	377 (97%)	176 (45%)	201 (52%)	
YES	11 (2.8%)	7 (1.8%)	4 (1.0%)	
Secretory Endometrium				**0.032**
NO	362 (93%)	176 (45%)	186 (48%)	
YES	26 (6.7%)	7 (1.8%)	19 (4.9%)	
Proliferative Endometrium				0.300
NO	358 (92%)	166 (43%)	192 (49%)	
YES	30 (7.7%)	17 (4.4%)	13 (3.4%)	
Malignant Neoplasm				**0.004**
NO	328 (85%)	165 (43%)	163 (42%)	
YES	60 (15%)	18 (4.6%)	42 (11%)	
Endometrial Hyperplasia				**0.049**
NO	374 (96%)	180 (46%)	194 (50%)	
YES	14 (3.6%)	3 (0.8%)	11 (2.8%)	

n/(%) Median (IQR)

Chi-square test of independence; Wilcoxon rank-sum test; Fisher's exact test

DISCUSSION

The result of the statistical analysis obtained in this study established the epidemiological profile of the patients seen at the Hysteroscopy Service of the University Hospital between 2011 and 2022, identifying the main complaints and the clinical profile of women undergoing hysteroscopic examination at the service. The prevalence and incidence of the main uterine pathologies were also obtained in this research. 3804 patients were included in the study, ranging in age from 18 to 92 years old, making this one of the most representative cohorts in the field of hysteroscopy, and encompassing diverse subgroups undergoing the technique and with a robust compilation of data. So far, few studies have had such a significant sample size in Brazil and worldwide.

Most of the participants were between 34 and 65 years old, with a mean age of 49.97 years, presenting a similar result to what was found in the literature, with a mean of 41.2 years[10]. Regarding reproductive status, 44.6% of women were postmenopausal (not menstruating for 12 consecutive months). This finding aligns with other similar studies where the percentage of postmenopausal women analyzed varied from 32.3% to 62.8%[11,12,13].

Furthermore, the average number of children among the participants was 2.67. However, when comparing the different age groups analyzed, this value varied significantly. In patients between 60 and 70 years old, the average number of children was 3.7, whereas among patients aged 40 to 50 years, this average was 2.3 children. This can be justified by the trend of a reduction in the number of children per woman across Brazilian generations, as the fertility rate in Brazil decreased from 2.08 children per woman of fertile age in 2000 to 1.56 in the latest year of 2023[14].

Another important point to highlight is that the presence of comorbidities often favors the presence of endometrial abnormalities that can be identified through Hysteroscopy. In a baseline study, both Hypertension and Diabetes were identified as independent risk factors for the development of endometrial polyps[10]. On the other hand, a 70% association was observed between histological diagnoses of endometrial cancer and Systemic Arterial[15].

In the present study, the majority of included women presented some comorbidity (56%). Systemic Arterial Hypertension was the most prevalent among them, affecting 39% of all patients. Diabetes, in second place, affected 13% of the patients. Comparing this study with a similar study conducted in the Northeast region of Brazil, despite the significantly smaller sample size, similar rates were observed among comorbidities, 47.1% and 11.8% respectively. However, in a tertiary center in Turkey, a lower rate of hypertensive patients was observed (9%), which was also noted in Hong Kong, in a study addressing the same patient profile (27.1%)[16,17].

Consistent with the current literature, the main complaint identified was Abnormal Uterine Bleeding (AUB), affecting 44% of the women included in the study. This is a condition that can severely affect the quality of life of patients, interfering with their well-being in various spheres, including the psychological, social, and financial aspects[18]. For these patients, hysteroscopic examination holds significant value as it allows for the identification of endometrial pathologies during the procedure, as well as offering the possibility of biopsy, excision, or treatment at the same time, enabling the establishment of an accurate diagnosis[9].

The main finding related to AUB in the literature is the presence of endometrial polyps, as a study published in 2023 showed that 45% of patients with AUB complaints had a polypoid endometrial pattern on hyste-

roscopic examination[19]. However, concerning the findings of patients with AUB in the present study, it was noted that only 22% of patients with AUB showed a polyp on hysteroscopy. This value, however, increased to 29% once a biopsy was performed, approaching what is found in the literature[20,21].

The second most frequent complaint addressed asymptomatic patients with an indication for endometrial evaluation due to thickening identified on ultrasound (43%). This condition was closely associated with postmenopausal patients, which can be correlated with the fact that the cutoff point for endometrial thickening in this group is lower than in fertile-age patients (4 mm).

In the case of women in this age group, the insights provided by hysteroscopy become even more important because the prevalence of atypical endometrial hyperplasia and endometrial carcinoma is higher. Therefore, ruling out these conditions through hysteroscopic examination is necessary, with hysteroscopy being the gold standard for diagnosing any malignant endometrial pathology or potential malignancy[22,23].

On transvaginal ultrasound examination, the main alterations found in the female reproductive tract were endometrial thickening (40%) and polyps (33%). However, during hysteroscopy, only 12% of participants showed endometrial thickening upon direct visualization, with the main hysteroscopic finding in the study being the presence of endometrial polyps in the cavity, affecting 50% of the patients.

This data can be correlated with other studies that have observed that a significant portion of women with endometrial thickening on ultrasound actually have other intrauterine pathologies when undergoing hysteroscopy[24]. In another study published in 2020 and conducted in the same institution, this same pattern was observed, showing a significant association between endometrial thickening on ultrasound and the presence of polypoid lesions in the uterine cavity of patients undergoing hysteroscopy[25]. Therefore, it is important to consider that finding endometrial thickening on ultrasound may indicate the presence of potential endometrial lesions, with hysteroscopy being the appropriate examination for further investigation.

Regarding histopathological findings, it was found that 61% of them corresponded to polyps, and only 15% of biopsies had findings suggestive of malignancy. Consequently, similar to findings in the literature, endometrial polyps are the main findings upon biopsy[26].

It is worth noting that often, uterine cavity observation does not allow for a concrete diagnosis. As seen in this study, there is a higher prevalence of benign findings despite suspicious lesions on hysteroscopy. Therefore, in cases where hysteroscopy cannot define the specific endometrial pathology, performing an endometrial biopsy facilitates the diagnosis[27]. Hence, it is recommended to biopsy any histological material removed during hysteroscopic examination, whether the patients are symptomatic or asymptomatic[24].

In terms of referrals made, 0.6% of patients were directly referred to Oncology, which is related to the finding of an extremely suspicious endometrial carcinoma lesion on hysteroscopy. On the other hand, the majority of patients in this study (51%) were discharged after hysteroscopy examination, or (45%) were referred for the management of larger benign lesions through surgical hysteroscopy in the same institution. Thus, it is evident that hysteroscopy, being a simple and safe technique, offers great precision in both diagnosing uterine pathologies and ruling them out, with significant advantages over other diagnostic and therapeutic modalities for intrauterine pathologies[27,28]. Therefore, its high resolvability, through the "see and treat" approach, explains the low need for specific

referrals for these patients and allows for subsequent outpatient follow-up without the need for major interventions.

CONCLUSION

This study provided a comprehensive analysis of outpatient hysteroscopy in an Ambulatory Hysteroscopy Unit linked to the Brazilian Unified Health System (SUS). The work offered a detailed analysis of the epidemiological profile of women undergoing this procedure, aligning with the findings of current literature on the subject.

Lastly, the importance of this examination in gynecological medical practice is emphasized, aiming to guide care for this population by further investing in promoting care and information that may reduce the incidence of intrauterine pathologies. Additionally, providing adequate and targeted assistance to improve patients' access to this examination is crucial.

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