



## ORIGINAL ARTICLE

# Office Hysteroscopy: King Hamad University Hospital Experience

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### Abstract

**Background & Objective:** Office hysteroscopy (OH) is an efficient alternative for diagnosis and management of intrauterine pathology. The main goal of this study is to determine the usefulness and tolerability of OH in the patient population of a tertiary teaching hospital in the Kingdom of Bahrain.

**Methods:** The total population consists of 101 patients who were prospectively included in the study from 2018 to 2020. The main indication for OH were abnormal uterine bleeding followed by post-menopausal bleeding.

**Results:** The procedure was tolerable without analgesia in 93% of cases, analgesia was required in 3.96% of cases, and minor complications consisted of abdominal pain and dizziness (0.99%), as well as uterine bleeding (0.99 %). Given a success rate of 90% using a 1.8mm diameter hysteroscope, it can be concluded that OH with Etonox (N<sub>2</sub>O<sub>2</sub>) as an analgesic is a safe and feasible procedure for patients of varying ages and parities.

**Conclusion:** OH is particularly useful in the workup of abnormal uterine bleeding, post-menopausal bleeding, assisted IUCD removal, endometrial biopsy, and the removal of small polyps.

**Keywords:** Outpatient clinic, Office Hysteroscopy, Procedural sedation, Procedural tolerability, Gynecology, Minimally Invasive Therapy

### Introduction

Hysteroscopy is a word derived from the Greek term *hysteros*, meaning uterus, and *scopy*, meaning to look.<sup>1</sup> The first hysteroscopy was performed by Diomedes Pantaleoni in 1869 who managed to diagnose a small endometrial polyp in a 60-year-old woman suffering from abnormal uterine bleeding.<sup>2</sup> Various distension medias were then explored. In 1925, I.C. Rubin chose to use Carbon Dioxide (CO<sub>2</sub>) as a gas and CJ Gauss used a flow of liquid instilled from a height of 50 cm.<sup>3,4</sup>

Prior to the popularity of hysteroscopes in the 1970s, the diagnosis and treatment of intrauterine diseases was mainly based on dilation and curettage (D&C).<sup>1</sup> However, research studies found that there was a high percentage of false negatives associated with identifying focal lesions within the uterine cavity. In addition, the technique of blind dilatation carries a well-documented risk of perforation.<sup>5</sup>

Hysteroscopies previously required hospital admission and were performed in an operating room under general anaesthesia. The instrument itself

was then redesigned throughout time with the help of technological advancements to be less invasive and possible in an ambulatory setting (outpatient hysteroscopy, also known as an office hysteroscopy (OH)).<sup>1</sup>

A meta-analysis that assessed the accuracy and feasibility of outpatient diagnostic hysteroscopies in the evaluation of women with abnormal uterine bleeding included sixteen studies. They compared biopsies taken from OH with guided biopsy during an operative hysteroscopy and during a hysterectomy. The meta-analysis concluded a sensitivity of 0.94 and specificity of 0.89.<sup>6</sup>

In general, office-based procedures are associated with higher patient satisfaction and faster recovery.<sup>7</sup> Additional benefits include patient and physician convenience, avoidance of general anesthesia, reduced patient anxiety due to familiarity with the office setting, and cost effectiveness;<sup>8</sup> thus, leading to more efficient use of the operating room for more complex hysteroscopic cases.<sup>7</sup>

This study aims to determine the usefulness and tolerability of OH in the patient population of a tertiary teaching hospital in the Kingdom of Bahrain.

## Materials & Methods

This study was registered and ethically approved by the Institutional Review Board of King Hamad University Hospital. Using convenience sampling, patients who met the clinical criteria for further hysteroscopic investigation were recruited between 2018 and 2020. All patients with missing intra uterine contraceptive device, those suffering from abnormal uterine bleeding and those with recurrent implantation failure following IVF. Patients with recurrent miscarriages and with abnormal endometrium on Tamoxifen were also included. Patients with active cervical or uterine infection, pregnancy, and known cervical or uterine cancer were excluded from the study. A written informed consent was provided to each patient.

The procedures were performed according to RCOG guidelines in the Hysteroscopy Room of the Gynecology outpatient department (OPD) for easy access by patients during working hours.<sup>9</sup>

The hysteroscopy we used to be the Gynecare Versascope Hysteroscopy System with a 90° field of view, 1.8mm diameter, with an expandable hysteroscopic sheath as the operative channel.



**Figure 1:** Office Hysteroscopy (OH) setup at the outpatient department of King Hamad University Hospital

After initial counselling in the clinic and in the OH room, the patient was first shown the hysteroscope and the instruments that would be used. They were then told how the procedure would be performed and that the procedure could be stopped at any point in time upon their request. The patient was also informed that a tolerable level of discomfort may be present and that a cylinder of Etonox (N<sub>2</sub>O<sub>2</sub>) would be available on demand in case they felt an analgesic was required.

There were no specific pre-procedure preparations required apart from excluding pregnancy and avoiding the procedure in case of active bleeding. The patient was placed in the lithotomy position and after digital assessment of the uterus, a Cusco's speculum was introduced into the vagina to visualize the cervix. The area was then cleaned with iodine. No tenaculum was used and on many occasions a vaginal speculum was not needed. The hysteroscope was attached to the camera which was adjusted before introducing the scope. The distension medium was normal saline, and the lowest possible pressure was used to distend the uterine cavity. The movement of the hysteroscope was then maneuvered gently. During the procedure, the patient was able to visualize her uterine cavity on a monitor.

If a biopsy was needed, it was performed by a hysteroscopy biopsy forceps or an aspiration cannula. Hysteroscopy scissors were also available for the removal of small lesions and grasping forceps for removal of missed IUCDs. Upon conclusion of the procedure, the patient was prescribed paracetamol or an NSAID for potential abdominal pain and was advised that there may be some vaginal bleeding.

Data was collected using electronic medical records and documentation on the day of the procedure. Specific variables included the patient's age, parity, gynecological history, previous surgical history, indication of the hysteroscopy, use of analgesia, findings during the procedure, whether biopsies were taken, how they correlated to histopathology, reasons for failure of the procedure, and any complications that occurred. These variables were compiled into a Microsoft excel sheet and then analyzed to determine the incidence of categorical variables.

## Results

A total of 101 office hysteroscopies were performed at King Hamad University Hospital from 2018 to 2020, which accounted for 40% of all hysteroscopies performed during the duration of the study.

The median patient age was 43 years (range: 24-78 years). From all recoded cases, 15 (14.85%) patients were nulliparous, 76 (75.25%) patients had a parity of between 1 and 5, and 10 (9.9%) had a parity of more than 5. In total, 57 patients had a history of previous uterine surgery or investigative procedure. These procedures included Evacuation of Retained Products of Conception (ERPC, 5; 4.95%), Dilation and Curettage (D&C, 10; 9.9%), one or more previous Cesarean Sections (CS, 36; 35.64%), previous hysteroscopy (5, 4.95%), previous cervical cone biopsy (1, 0.99%). Additionally, the most common medical indication of performing hysteroscopy was abnormal uterine bleeding (48; 47.25%), and post-menopausal bleeding (14; 13.86%).

Table 1 shows all the medical indications of OH. No analgesia was needed in 94 patients (93.00%), 4 patients required Etonox analgesia (3.96%), and 3 patients (2.97%) could not tolerate the procedure. These three patients were of varying ages and

parities; the first being a 42-year-old patient, Para 1+1 with a history of previous Cesarean Section who presented with abnormal uterine bleeding, the second being 40 years of age, Para 0+1 who underwent infertility investigations, and the third was a 76-years-, Para 2+0 on Tamoxifen who was investigated for a thickened endometrium.

**Table 1: Medical indications of office hysteroscopies**

|  | Cases |       |
|--|-------|-------|
|  | n     | (%)   |
| Recurrent In Vitro Fertilisation (IVF) failure   | 12    | 11.88 |
| Abnormal Uterine Bleeding                        | 48    | 47.52 |
| Abnormal Endometrium on Ultrasound*              | 7     | 6.93  |
| Endometrial Polyp                                | 7     | 6.93  |
| Post-Menopausal Bleeding                         | 14    | 13.86 |
| Intrauterine Contraceptive Device (IUCD) Removal | 13    | 12.87 |

\*For patients on Tamoxifen Therapy

Table 2 shows the causes of abandoned procedure, which included having a narrow cervical os, large cervical mass, and large enterocele. These cases could have been excluded from OH upon examination in the clinic. On the other hand, there were no complications in 98 hysteroscopies (97.03%). However, there was 1 case of abdominal pain associated with dizziness (0.99%) and 1 case of bleeding (0.99%), which were solved rapidly with general measures (no medication was required).

**Table 2: Causes of abandoned procedure**

|                     | Cases |      |
|---------------------|-------|------|
|                     | n     | (%)  |
| Narrow Cervical Os  | 5     | 4.95 |
| Large Cervical Mass | 1     | 0.99 |
| Large Enterocele    | 1     | 0.99 |

The uterine cavity was assessable in 91 (90.10%) cases. Among them, 29 had normal hysteroscopy findings (31.87%) and 11 cases were related to IUCD removal as a result of breakage or misplacement (12.09%). There were various cervical abnormalities

identified in 3 cases (3.30%, related to cervicitis, atrophy, easy bleeding), and uterine pathology was identified in 48 cases (52.75%). The most common pathology was endometrial polyps (22; 45.83%), followed by endometrial irregularities and submucosal fibroids. The pathologies observed are presented in Table 3.

**Table 3. Pathology found inside uterine cavity**

|   | Cases |       |
|---|-------|-------|
|   | n     | (%)   |
| Endometrial Polyps  | 22    | 45.83 |
| Endometrial Irregularities<br>(atrophied or hypertrophied or<br>polypoid or tubular or folding) | 17    | 35.42 |
| Fibroids  | 8     | 16.67 |
| Retained products of conception   | 1     | 2.08  |

Among the 48 cases of endometrial abnormalities, a total of 63% were confirmed on biopsy to have a normal endometrium corresponding to age and menstrual cycle of the patient. There were 17 confirmed benign polyps, 1 case of endometrial hyperplasia, and no malignant cases.

## Discussion

Hysteroscopy is the gold standard procedure for uterine cavity assessment because it provides direct visualization, biopsy, and an opportunity of concurrent treatment of intracavitary pathology yet it is estimated that less than 20% of gynecologists utilize OH to evaluate uterine pathology.<sup>1,10</sup>

The main indications for OH at our tertiary teaching hospital were abnormal uterine bleeding followed by post-menopausal bleeding, IUCD removal, investigations of recurrent implantation failure following IVF, and evaluation of thickened endometrium during Tamoxifen therapy. This is in line with published clinical indications for OH, which include abnormal uterine bleeding, post-menopausal bleeding, evaluation of the uterine cavity in recurrent implantation failure or unexplained infertility, recurrent miscarriages, investigations of endometrial thickening and endocervical lesions. In addition, it can assist with further investigations of polyps and fibroids, IUCD removal, and sterilization.<sup>11</sup>

Our study achieved its goals of identifying the tolerability of OH and frequency of Etonox used during the procedure. The procedure was tolerable without analgesia in 93% of our patient sample. This is consistent with a majority of published studies that have reported high success rates without the use of analgesia.<sup>12-15</sup> In a randomized controlled trial (RCT) of 100 women in Britain, the majority (78%) found the pain of the procedure to be less than that of normal menstrual pain.<sup>16</sup> Our results can also be attributed to the 1.8mm size scope used in our study as less pain, better visualization and higher success rates have been observed with mini hysteroscopy (using a <3.5mm scope) than 5.0mm conventional instruments.<sup>17</sup>

Etonox (N<sub>2</sub>O<sub>2</sub>) was used in 3.96% of our cases as it is safe, effective, and is a readily available analgesic in the OB&GYN department. Trials have shown promising results for nitrous oxide and music therapy via headphones for analgesia and reduction of anxiety.<sup>18,19</sup> Other methods of analgesia for OH have been cited in literature. According to two meta-analyses, one conducted by Ahmad et al and the other by De Silva et al, there is evidence of benefit for the use of local anesthetics during and after outpatient hysteroscopy.<sup>20,21</sup> Local anesthesia via paracervical, intracervical, intrauterine, and topical routes have been compared. A meta-analysis of 20 RCTs concluded the paracervical approach to be superior.<sup>22</sup> In post-menopausal women, local anesthetics may be considered to reduce the failure rate (Ahmad et al. 2011) or prostaglandin ripening to reduce pain scores.<sup>22</sup> Our data showed that N<sub>2</sub>O<sub>2</sub> is effective if needed.

Following OH, patients at our tertiary center were prescribed paracetamol or an NSAID. This practice is consistent with a meta-analysis of six randomized control trials which found an improvement in pain scores with both non-steroidal anti-inflammatory drugs and opiates, particularly with post-procedure pain, however, more side effects were observed with opiates.<sup>22</sup>

Our study showed that parity, age, and previous uterine surgery did not show any influence on hysteroscopic practicability. In a study by Campo et al., success rates for larger scopes (>5.0mm)

were higher for patients who have had vaginal deliveries and when experienced surgeons were involved. However, the effects of patient parity are less important when mini hysteroscopy was used.<sup>17</sup> Rullo et al (2005) concluded that regardless of scope size (2.7mm and 4mm), menopausal status was the most important factor influencing the practicability of the hysteroscopic procedure.<sup>23</sup>

The histology results of our study mostly confirmed normal endometrium, benign polyps, and endometrial hyperplasia. A systematic review of the diagnostic accuracy for hysteroscopies was high for endometrial cancer, polyps and submucous myomas, but only moderate for endometrial hyperplasia.<sup>24</sup>

Complications from OH can include failure, pain, feeling faint or sick, bleeding, infection, and uterine perforation.<sup>11</sup> This is in line with our results where two procedures were associated with bleeding and abdominal pain associated with dizziness. A study in Canada analyzed the long-term complications of 1028 OH with the vaginoscopic approach from 2005 to 2007, which showed a long-term complication rate of 1/1028 (0.001%).<sup>25</sup> In the pooled analysis of a systematic review by Bennett et al, 2019 the number of adverse events did not significantly differ between the outpatient and operating room setting.<sup>26</sup>

Our study revealed a 9.9% rate of failed or an abandoned procedure. This is consistent with a retrospective observational study of 2402 patients at a French teaching hospital, where a failure rate of 9.5% was reported mainly for older women with postmenopausal bleeding.<sup>27</sup> According to a study of 31,052 patients at two university teaching hospitals in Italy looking at strategies to overcome anatomical impediments to ambulatory hysteroscopy, cervical stenosis and pain were the main reasons for failed hysteroscopy.<sup>15</sup> All four grades of cervical stenosis were managed successfully with minimal discomfort in 98.5% of cases with technical maneuvers and miniaturized mechanical and/or bipolar instruments.<sup>15</sup> Some hospitals have also tried to develop a Hysteroscopy Failure Index (HFI) where 76% of cases were successfully predicted.<sup>28</sup>

There are very few regional studies or comparative studies regarding the use of office hysteroscopies. A study by Madan et al. who analyzed retrospective

hospital data regarding operative hysteroscopies at Salmaniya Medical Center, Bahrain from 1995 to 1998 concluded that office hysteroscopies with directed biopsies could be carried out to reduce hospital diagnostic dilatation and curettage.<sup>29</sup> We hope that this study can add to the existing body of literature in the region and encourage the use of OH.

In a systematic review and meta-analysis comparing outpatient versus operating room hysteroscopy, seven economic studies concluded that an outpatient hysteroscopy with a cost range of US\$97–1258, is significantly less expensive than operating room hysteroscopies with a cost range of US\$258–3144.<sup>26</sup>

There have been exciting updates regarding the role of OH in women who have experienced repeated implantation failure (RIF) and the therapeutic potential of OH. A meta-analysis of 4143 patients revealed that clinical pregnancy rates and live birth rates were both significantly higher in RIF patients with OH than RIF patients without OH.<sup>30</sup> A four-year evaluation of therapeutic hysteroscopy in the outpatient setting revealed a satisfaction rate of 96% following myomectomy, removal of retained products of conception and endometrial ablation.<sup>31</sup> Vitale et al cites new mechanical and bipolar devices, which make it possible to perform challenging myomectomies, remove placental residues, treat endometrial thickenings, correct small isthmoceles, and perform hysteroscopic metroplasty for septate uteri in the office (2020).<sup>32</sup> An important finding by Bennett et al revealed that there were no significant differences between outpatient and operating room hysteroscopy in terms of treatment success.<sup>26</sup>

With its wide range of applications, safety, satisfaction, and cost-effectiveness, OH should be available in every gynecology clinic and all junior staff should be trained in this procedure.

A limitation in this study is sample size. A future multi-centric study can be conducted, which looks at a wider sampling of patients in the country and the potential for therapeutic OH. Additionally, measuring pain scores via the Visual Analogue Scale prior to the procedure and after would have allowed for comparison with other studies that use scopes of a different diameter.

## Conclusion

Given a success rate of 90% using a 1.8mm diameter hysteroscope, we can conclude that OH in an outpatient setting with the option of Etonox (N<sub>2</sub>O<sub>2</sub>) is a safe and feasible procedure for patients of varying ages and parities. Proper selection of cases increases the success rate of OH and is particularly useful in the workup of abnormal uterine bleeding, post-menopausal bleeding, circumstances requiring assisted IUCD removal, endometrial biopsy, and the removal of small polyps. Etonox (N<sub>2</sub>O<sub>2</sub>) is a helpful and readily available analgesic.

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## Conflict of interest

The authors confirm that there was no conflict of interests

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