Randomized Controlled Trial of Manual Vacuum Aspiration Versus Novak Curette for Endometrial Sampling*

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Objective: **This study was designed to compare the accuracy of Manual Vacuum Aspiration (MVA) and Novak curette for endometrial biopsy in the evaluation of abnormal uterine bleeding.** *Methods:* **The 68 enrollees were randomized into two groups, the MVA group and the Novak curette group. The study utilized block randomization where the sequence of the treatment assignment is randomly selected based on a set of random numbers generated. The outcome measured is specimen adequacy which is the volume of tissue yielded from the procedure for which the pathologist will make diagnosis. The operating time and the safety of the two procedures were also assessed.** *Results:* **The percentage of inadequate samples was significantly higher in the Novak curette group (21.4%) than in the MVA group (2.9 %). The exact two-tailed p-value was 0.039. The mean operating time was also significantly higher in the Novak curette group, the percentage of patients who reported tachycardia and pain in the MVA and Novak curette groups were 17.9% and 75%, respectively. There were a significantly higher percentage of patients who needed additional analgesic in the Novak curette group (75%).** *Conclusion:* **Manual vacuum aspiration is better than Novak curette as an instrument for endometrial biopsy in terms of specimen adequacy, operating time and safety.**

Key words: **endometrial biopsy, manual vacuum aspiration. Novak curette**

Abnormal Uterine Bleeding (AUB) accounts for more than 70 percent of all gynecological consultations in the peri and postmenopausal years[1]. Comparable percentage is likewise observed in our institution. Although abnormal uterine bleeding accounts for 37 percent of all gynecologic admissions in the Philippines[2], there are no records as to the magnitude of women who sought consultation with this gynecologic problem. Investigations of abnormal uterine bleeding in this age group aim to exclude endometrial pathology which is more likely to be present the more frequent the episodes of bleeding are.[3]

Endometrial biopsy for the evaluation of abnormal uterine bleeding and other indications remains as one of the most commonly performed gynecologic procedure. In recent years, a simpler, less morbid and more inexpensive outpatient sampling method has replaced the traditional in-hospital uterine curettage.

It has the advantages of being simple, quick, safe, inexpensive and convenient, avoiding the need for anesthesia. Endometrial biopsy, however, is a blind procedure, thus not all of endometrial surface will be sampled.[4]

Manual Vacuum Aspiration (MVA) is a safe and cost effective technique that is used for uterine evacuation including treatment of incomplete 1st trimester abortion for uterine sizes up to 12 weeks. It has also been used reliably for evaluation of the endometrium in cancer and infertility screening.[5]

Novak curette has been shown to be as accurate as curettage when endometrial histologic results are compered[6]. Endometrial biopsy using the Novak's curette followed by endometrial curettage showed a sensitivity of 83.3% and a specificity of 100%. The accuracy was 99.7%. Based on the diagnosis of abnormal endometrium, a sensitivity of 37.8%, specificity of 98.7% and accuracy of 90.0% were seen.[7]

Other devices were likewise evaluated in terms of accuracy. The Explora device and the Karman cannula provide accuracy of 87% and 82%, respectively.[8,9] Improved sensitivity was noted with hysteroscopy (98%) compared to sharp curettage (65%).[10] The Pipelle biopsy was also found to be adequate for analysis of the endometrium in 63 of 65 patients (97%).[11]

In spite of the extensive review of literature, there was no study found comparing the efficacy of MVA and Novak curette for endometrial biopsy. This randomized study was designed to compare the

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accuracy, safety and side effects of MVA and Novak curette for endometrial biopsy.

OBJECTIVES

General Objective

To compare the accuracy, safety and side effects of Manual Vacuum Aspiration (MVA) and Novak curette as a diagnostic procedure for the evaluation of the endometrium in women presenting with AUB.

Specific Objectives

1. To compare the adequacy of tissue specimen yield for the pathologist to make diagnosis.
2. To compare operative time between MVA and Novak curette for endometrial sampling.
3. To compare the safety of MVA and Novak curette for endometrial sampling.

MATERIALS AND METHODS

Women with AUB seen at the Out Patient Department of JRRMMC from January 2005 until July 2005 who needed endometrial biopsy were enrolled in this study.

Women with positive pregnancy test, stenotic cervical ostium, medically unstable patients requiring transfusion prior to procedure and those not wishing to participate or did not want to sign a written consent were excluded.

A total of 68 patients were enrolled in the study. The 68 enrollees were randomized into group A, the MVA group and group B, Novak curette group after obtaining written informed consent. The study utilized a block randomization where the sequence of the treatment assignment is randomly selected based on a set of random numbers generated. Odd numbers shall represent a treatment sequence of A-B and even numbers shall represent a treatment sequence of B-A. Each number automatically represents two respondents thereby yielding equal number of subjects for each group.

Baseline detailed clinical history and complete physical examination were done on all patients. The patient age, gravidity, parity and menstrual histories were noted.

Pre-operatively, patients were given mefenamic acid 1 gram orally, 30 minutes prior to the procedure. MVA was done by evacuation of uterine contents by suction through a cannula into a hand-held vacuum syringe. On the other hand, Novak curettage refers to curetting or scraping of endometrial tissue from the fundus to the lower uterine segment area in a zigzag fashion in a single attempt. Post-operatively, patients were given Amoxicillin 500 mg cap, TID for 7 days.

To test the efficacy of both procedures, all patients were evaluated using the following parameters: time consumed to complete the procedure, patients request for analgesia, change in the vital signs (blood pressure, cardiac rate, respiratory rate and temperature), onset of complication manifested as hypotension, tachycardia and/or increased bleeding.

The main outcome measured was specimen adequacy, defined as the volume of tissue obtained during the procedure for the pathologist to make diagnosis. Only one pathologist evaluated the specimen from both groups. An inadequate sample was defined as consisting of only blood or cervical mucus with fragments of endocervical tissues or a large amount of blood with only small fragments of endometrial glands and stroma. In those patients requiring hysterectomy, pathologic findings on endometrial biopsy were compared with histologic result at the time of hysterectomy.

The operative time between MVA and Novak curette for endometrial sampling was also assessed. Time of operation was measured as follows: Group A: Time Start - time from the moment the speculum was inserted into the vagina, Time Finished - time when endometrial tissues were aspirated. Group B Time Start - time from the moment the speculum was inserted into the vagina: Time Finished - time when endometrial tissues were obtained after zigzag technique.

The safety of the two procedures was assessed based on the following criteria: side effects (tachycardia, pain/cramps), and complication (massive blood loss, perforation, infection and need for additional analgesic). There is presence of tachycardia if the HR increased to >100/min. Presence of pain was noted if the patient expressed onset of pain during the procedure or if she is already experiencing pain, the severity is greater than what she experienced during the procedure. Massive blood loss if there are more than 10 fully soaked OS (4 x8 cm). We estimated one fully soaked OS is around 25 cc.

Descriptive statistics (mean, standard deviation and percentages) were used to summarize the demographic variables. Chi-square test (or Fisher's

Exact Test) was used to test if there are significant differences in proportions between the two treatment groups. Fisher's Exact Test was the small sample counterpart of Chi-square Test and it is used when more than 20 percent of the table cells have expected frequencies less than 5. T-test was used to test for significance of means of quantitative variables. All tests were performed using a 0.05 level of significance.

Statistical Package for Social Sciences version 10 (SPSS ver 10) was used for the data analysis and Microsoft excel for data management.

RESULTS

A total of 68 patients were analyzed. Thirty-four were randomly assigned to the MVA group and 28 to the Novak curette group using block randomization. The inequality in sample sizes was due to the patients who dropped out from the study. Six patients dropped out from the Novak curette group due to pain/cramps at the start of the procedure.

The age distribution in both groups was similar. The mean age of the patients in the manual vacuum aspiration group was 43.82 years ± 9.12 years and 43.54 years ± 7.64 years in the Novak curette group. Only one patient in each of the treatment group was classified as nulligravid in the GP variable (Table 1).

Table 1. Summary statistics of demographic variables.

Variables	MVA	Novak curette	p-values
N	34	28	
Age (years)			
Mean	43.82	43.54	0.895
Standard Deviation	9.12	7.64	
GP			
Nulligravida	1 (2.9%)	1 (3.5%)	1.0
Multiparity	33 (97.1%)	27 (96.4%)	

Outcome Variables

The result of the histopathology, operative time, safety of MVA and Novak curette were the main outcomes evaluated in the study. There were 7 inadequate samples rendered by the pathologist, 1 (2.9%) from the MVA group and 6 (21.4%) from the Novak curette group. The percentage of inadequate samples was significantly higher in the Novak curette group (21.4%) than in the MVA group (2.9 %). The exact two-tailed p-value was 0.039. The mean operating time was also significantly higher in the Novak curette group. Results of these tests are summarized in Table 2.

Table 2. Results of statistical tests on specimen adequacy and operating time

Variables	MVA	Novak curette	p-values
N	34	34	
Histopathology result			
Inadequate	1 (2.9%)	6 (21.4%)	0.039
Adequate	33 (97.1%)	22 (78.6%)	
Operative Time (sec)	291.94	445.14	0.000
Mean			
Standard Deviation	44.35	73.67	

The percentage of patients who reported tachycardia (17.9%) and pain (75%) were higher in the Novak curette group. There were also a significantly higher percentage of patients who needed additional analgesic in this group (75%). A tabulation of these variables is shown in Table 3.

Table 3. Safety profile of the patients in the two treatment groups.

Variables	MVA	Novak curette	p-values
N	34	34	
Pain /Cramps			
Yes	1 (2.9%)	27 (79.5%)	0.000
No	33 (97.1%)	7 (20.5%)	
Tachycardia			
Yes	1 (2.9%)	6 (17.9%)	0.092
No	33 (97.1%)	28 (82.1%)	
Blood loss			
>25cc	4 (11.8%)	26 (89.3%)	0.000
<25cc	30 (88.2%)	39 (10.7%)	
Additional analgesic			
Yes	0	21 (75%)	0.000
No	34 (100%)	7 (25%)	

Twenty one patients underwent hysterectomy subsequent to endometrial sampling, 12 in the MVA group and 9 in the Novak curette group. The endometrial histologic results of hysterectomy specimen were consistent with the endometrial sampling histologic results in all patients.

DISCUSSION

Abnormal uterine bleeding after the age of 40 years requires further evaluation to exclude the presence of endometrial polyps, hyperplasia, fibroids or carcinoma. Younger women may also need endometrial evaluation if abnormal bleeding doesn't rapidly resolve with the oral contraceptive pill or synthetic prostaglandin inhibitors. In certain conditions, such as the polycystic ovary syndrome in which endometrial hyperplasia is more common, endometrial assessment may be necessary if abnormal uterine bleeding is continuous.

Office endometrial sampling devices offer reduced expense, less anesthesia requirements, increased convenience, and increased safety.

Hysteroscopy with directed biopsy has been shown to be superior, but this procedure requires specialized equipment and is very operator dependent[14]. In this study, two different devices that are commonly used for the evaluation of the endometrium were compared. The Novak curette has been in use for a long time while the MVA became popular only recently.

Significant differences with regards to accuracy and safety were observed using the two instruments.

In order for an outpatient endometrial biopsy to be a successful procedure, adequate specimens should be obtained. Insufficient sample is obtained from outpatient endometrial biopsy in 25-33 percent cases [4]. Inadequate endometrial samples may result from biopsy technique with non-representative sampling, varied pathological interpretation of an underlying atrophic endometrial state and poor patient tolerance.[15] Pain was a significant factor with the use of the Novak curette, as evidenced by the 5 drop-outs and the greater complaints in this group during the procedure. This might be related to the higher inadequate samples noted in the Novak curette group (21.4% vs 2.9%). Aspiration has a tendency to fragment the tissue making histologic analysis easier according to a previous report, whereas the Novak curette gives a 'strip' of endometrial tissue.[16] Patients with insufficient tissue for histologic analysis had either repeat endometrial sampling or underwent a formal curettage. No patient in this group was found to have hyperplasia, carcinoma or atrophic endometrium.

Previous studies failed to compare the operating time between the different endometrial biopsy instruments. The operating time is difficult to measure because it is influenced by several factors: the type of instruments, skill of surgeon and patient tolerance to the procedure. Nevertheless, this variable was assessed in this study in an objective manner as described above. The MVA group in this study was found to have a shorter operating time compared to the Novak curette group (291.94 ±44.35 vs 443.14 ±73.67).

The percentage of patients who reported complaints and side effects were significantly higher in Novak curette group. There was more blood loss in Novak curette (89.3%) compared with MVA group (11.8%). In addition, there is higher percentage of patients who needed additional analgesic in the Novak group(75%).

Stovall observed the same findings when he compared Novak with Pipelle—there is increased pain using the Novak.[17] There is also increased pain in Vabra devices compared to Pipelle, and this is said to be related to the negative pressure from the suction pump.[18] In this study, the MVA was associated with less pain and cramping (2.9%) than were Novak curette (75%).

CONCLUSION

In this study, it was found that inadequate samples and the mean operating time were significantly higher with the use of Novak curette. There are also more complaints of pain/cramps in the Novak curette group. The use of MVA yielded more adequate specimen and is associated with shorter operating time and less complications.

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