The impact of the manual vacuum aspiration (MVA) technique on health care services at Queen Elizabeth Central Teaching Hospital, Blantyre, Malawi

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Objectives. To assess the impact of the manual vacuum aspiration (MVA) technique on health care services and its acceptability to patients and staff.

Design. Prospective descriptive survey.

Setting. The university teaching hospital, Blantyre, Malawi.

Participants. All 456 patients who had MVA for treatment or investigation between 10 January and 9 April 1994, the nurses and doctors working in the unit and hospital administrators.

Main outcomes. Proportion of incomplete abortion patients who had MVA, the need for pain relief, patients' reactions, staff opinion, and reduction in ward occupancy rates and duration of hospitalisation.

Results. Of the total, 97.4% had MVA for treatment of incomplete abortion; these comprised 81.2% of all incomplete abortion patients treated during the study period. The mean volume of uterine contents was 33.4 ml. There was no relationship between the volume and either the gestational age or uterine size ($P > 0.05$). Only 10.7% of patients required pain relief. The bed occupancy rates in the gynaecological ward dropped from an average of 150% before to 130% after the introduction of MVA, and the mean hospital stay was reduced from 3 days, with 78.4% staying for more than 2 days, to 2 days, with 52% staying for less than 24 hours ($P < 0.05$). Most patients expressed general satisfaction with the method, while the staff were happier because their work had been made easier. There were no major complications associated with the procedure.

Conclusion. The findings show that MVA is a safe, reliable, effective and acceptable method of treating incomplete abortion, and can conserve hospital resources.

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Abortion is the main indication for acute gynaecological admissions at most health facilities in developing countries.[1-6] At Queen Elizabeth Central Teaching Hospital in Blantyre, it accounts for up to 60% of all gynaecological admissions, in spite of the many other gynaecological conditions admitted to the same ward.[4]

Whether induced or spontaneous, abortion is associated with relatively high morbidity and mortality in the developing world, where a contribution of up to 50% of all pregnancy-related deaths has been reported.[1,2,5,6-8] In our unit, it is responsible for about 30% of such deaths.[1,7] The associated morbidity is equally high.

The main causes of death and serious ill-health following abortion in Malawi, as in other African countries south of the Sahara, are genital sepsis and haemorrhage.[2,3,5-8,9-11] While these are the immediate causes, the major predisposing or operational factors include: (*i*) the nature (type) of abortion, with induced abortions carrying a higher risk; (*ii*) the gestational age at the time of termination; (*iii*) delay in seeking and/or being offered appropriate medical care; (*iv*) associated complications; (*v*) the quality and adequacy of the treatment offered; and (*vi*) other supportive measures.[2,3,6-9]

In our unit, delay in being offered appropriate treatment was observed to be the major factor predisposing to morbidity and mortality associated with abortion.[7] As a result thereof, several measures were instituted from mid-1993. One such measure was the introduction of the manual vacuum aspiration (MVA) technique in January 1994, with the support and assistance of the International Projects Assistance Services (IPAS). The main aim was to offer appropriate and timely treatment to patients with incomplete abortion, viz. evacuation, soon after admission and without the need for theatre and general anaesthesia. This would also enable patients to go home soon afterward, thus reducing the cost of abortion care.

All patients with incomplete abortion, whose gestational ages (or equivalent uterine sizes) are less than 14 weeks, and who do not have significant genital sepsis or injury, are treated soon after admission to the gynaecological ward (between 08h00 and 17h00 daily, and the following morning if admitted later with the MVA technique, except for those patients with excessive vaginal bleeding who are treated the same day in the departmental theatre, by sharp curettage under general anaesthesia. MVA is conducted in a special room within the gynaecological ward. After that the patients are observed in the gynaecological ward for an hour or two and, if they have no problem and are fit to go home, are prescribed antibiotics and analgesics and discharged. They are asked to report back to the ward if they have any problems related to the abortion, such as prolonged or heavy bleeding, lower abdominal pains or abnormal vaginal discharge within the following 2 weeks; when problems arise they are examined by the doctor on call and given appropriate treatment.

This study was conducted among all patients who underwent MVA, either for treatment of incomplete abortion or investigation, between January and April 1994. It looked at the acceptability of the procedure to the patients and the service providers, its safety, and its impact on health care services in terms of reduction of hospital stay and bed occupancy rates and any related problems that would require remedial action. The investigators felt that if it were found to be advantageous over the traditional sharp curettage, as had been shown elsewhere in the region,[12,14] we would recommend its extension to other health facilities in Malawi.

Subjects and methods

This was a prospective, descriptive study. It was conducted at Queen Elizabeth Central Teaching Hospital in Blantyre over a 3-month period between 10 January and 9 April 1994.

All women who were treated with MVA were requested to participate in this survey. A verbal consent was considered adequate as we were not administering anything new to them and the interview was a part of their history-taking and counselling. Those who agreed to take part in this survey were interviewed during the history-taking and counselling in order to assess their socio-demographic and reproductive profiles, as well as periods of amenorrhoea. During the course of examination, the uterine sizes and any other relevant findings were noted. During the procedure, the volume of uterine contents aspirated, the need for analgesia sedation or otherwise, and the patient's general reaction/response to the procedure were noted. These were recorded at the end of the procedure in the appropriate logbook. After the procedure and before discharge patients were asked what they felt about the technique.

All these data were later coded, entered into a computer and analysed with Epi-Info Version 5,0.

Results

A total of 456 MVA procedures were performed during the period of study. Of these, 97.4% were for treatment of incomplete abortion. These comprised 81.2% of all the incomplete abortions seen and treated at the unit during the period of study (Table I).

Table I. Indications for MVA

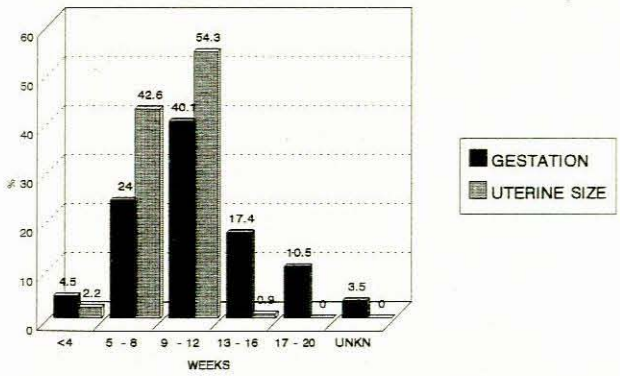
Indication	No.	%
Incomplete abortion	444	97.4
Endometrial biopsy	7	1.5
Missed abortion	5	1.1
Total	456	100.0

Index pregnancy

Gestational ages and uterine sizes. Their periods of amenorrhoea, as they could 'recollect', ranged from none (i.e. 4 weeks) to 20 weeks, with a mean of 11.7 weeks. The median was 12 weeks.

The uterine size, as determined by the attending doctors, ranged from normal (i.e. 4 weeks) to 14 weeks, with a mean of 9.7 weeks (Fig. 1).

F G.1. GESTATIONAL AGE AND UTERINE SIZE



g. 1. Gestational age and uterine size.

rocedure

annula size. All sizes of cannula (except size 5 which we id not have) were used. The size used most often was umber 10, followed closely by numbers 12 and 8. There as a strong relationship between the uterine size and that f the cannula used ($P < 0.05$) (Table II).

able II. Uterine size and cannula size used

terine ze wks)	Cannula size 4 (%)	6 (%)	7 (%)	8 (%)	9 (%)	10 (%)	12 (%)	Total No.	Total %
	66.7	15.4	0.0	0.0	0.0	0.0	0.0	10	2.2
	33.3	84.6	21.7	20.4	0.0	0.0	0.0	51	11.2
	0.0	0.0	78.3	78.6	71.4	13.3	0.0	143	31.4
	0.0	0.0	0.0	1.0	2.9	0.0	0.0	2	0.4
0	0.0	0.0	0.0	0.0	25.7	65.7	18.8	125	27.4
2	0.0	0.0	0.0	0.0	0.0	19.6	79.5	121	26.5
4	0.0	0.0	0.0	0.0	0.0	1.4	1.7	4	0.9
Total	2.0	5.7	5.0	22.4	7.7	31.1	26.1	456	100.0

Volume of aspirates. The blood loss during the procedure was very low, the volume of aspirated uterine contents ranging from 5 ml to 200 ml, with a mean of 33.4 ml. There was no relationship between the gestational periods, the uterine size and volume of uterine aspirates ($P > 0,05$) (Table III).

Table III. Volume of uterine aspirate and uterine size

Aspirate volume (ml)	Uterine size (wks) 4 (%)	6 (%)	8 (%)	9 (%)	10 (%)	12 (%)	14 (%)	Total No.	Total %
< 10	2.2	7.2	10.5	0.2	6.1	4.8	0.0	142	31.1
11 - 20	0.0	1.1	8.3	0.2	5.3	5.3	0.2	93	20.4
21 - 30	0.0	1.5	3.9	0.0	3.9	3.1	0.0	57	12.5
31 - 40	0.0	0.7	2.6	0.0	4.2	3.1	0.2	49	10.8
41 - 50	0.0	0.2	1.8	0.0	2.0	2.0	0.2	28	6.1
51 - 60	0.0	0.2	0.9	0.0	2.2	2.6	0.0	27	5.9
61 - 70	0.0	0.0	0.4	0.0	0.0	0.7	0.0	5	1.1
71 - 80	0.0	0.2	1.1	0.0	2.6	1.3	0.0	24	5.3
81 - 90	0.0	0.0	0.4	0.0	0.2	0.2	0.0	4	0.9
91 - 100	0.0	0.0	1.1	0.0	0.9	1.5	0.2	17	3.7
101 - 200	0.0	0.0	0.2	0.0	0.0	2.0	0.0	10	2.2
Total	2.2	11.2	31.4	0.4	27.4	26.5	0.9	456	100.0

Pain relief. The majority (89.3%) of all patients did not require/receive any pain-relieving drugs or sedatives. In these patients the procedure was performed under 'verbacaine' or 'oral analgesia/anaesthesia' (i.e. counselling); 10.3% received pethidine 50 mg, and 0.2% had diazepam 10 mg intravenously, before or during the procedure. Only 1 patient received more than one of these drugs. There was no relationship between the patient's age, parity or uterine size and the need for analgesia or sedation ($P > 0.05$).

Impact on service delivery

Patients' reaction to the procedure. Each patient was asked to rate how painful she thought the procedure was. Of the total, 27.6% said that it was not painful at all; 25.0% said it was very painful, of whom 9 (8.0%) would have preferred to have had it done under general anaesthesia. The rest said that although the procedure was painful, it was tolerable (Table IV). There was no relationship between the patients' ages, parity or uterine sizes and their subjective reaction to the procedure ($P > 0.05$).

Table IV. Reaction of patients to the procedure

Reaction	Frequency	%
Very painful (intolerable)	114	25.0
Painful but tolerable	216	47.4
Not painful	126	27.6
Total	456	100.0

With regard to general feelings about the procedure, the majority (86.0%) said that it was very good; 12.0% were not sure given that they did not know any other type (i.e. sharp curettage). The remaining 2.0% preffered sharp curettage, which they had had before.

Staff opinion. All the nurses working in the gynaecological ward felt that the procedure had made their work easier as there were fewer patients in the ward now, with less blood-stained linen, and fewer patients who needed to be wheeled into and out of theatre. The theatre nurses and anaesthetists were happy not to have to lift these patients onto and off the operating table any more.

The doctors were happy not to have to 'beg' for theatre space or an 'anaesthetist' in order to perform evacuations. They also said that because the evacuations are performed soon after admission, there is no backlog and their work had therefore become easier.

The hospital administration was equally happy with the procedure, mainly because the ward is now much cleaner, nurses are more willing than before to be posted to this ward, there is less blood-stained linen in the ward with less risk of infection to staff and patients, and there are fewer patients, making the nurses' work easier.

Complications. No major complications were observed during the period of study among these patients, either related to the procedure or to the abortion itself. Ten (2.2%) of the total group were reported to have fainted during or soon after the procedure; most of these had not eaten for a day or so, or had bled a lot before admission. Three (0.7%) of the patients with incomplete abortion in this study group required re-evacuation. Three (0.7%) of the patients with incomplete abortion required blood transfusion. They had all

bled a lot before admission and were admitted in shocked states. There were no maternal deaths related to or following the procedure during the entire period of study.

Bed occupancy rates. Between October and December 1993, the average daily bed occupancy rate was 74 (150.0%). This dropped slightly to an average of 65 (130.0%) between January and April 1994. Since January 1994, there has been a steady drop in the average daily bed occupancy rate (Fig. 2).

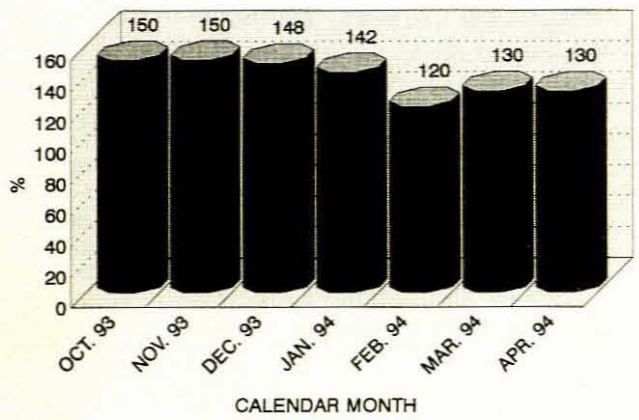


Fig. 2. Bed occupancy rates.

Hospital stay. During the 3 months prior to the introduction of the MVA technique in our unit, the duration of hospitalisation for patients with incomplete abortion averaged 3 days. Of these, 61.6% stayed in hospital for a period of 2 - 5 days. However, during the study period, the mean duration of hospitalisation for all patients with incomplete abortion was 2 days, with 72.2% of patients staying for 2 days or less. The difference between the two periods is statistically significant ($P < 0.05$) (Fig. 3).

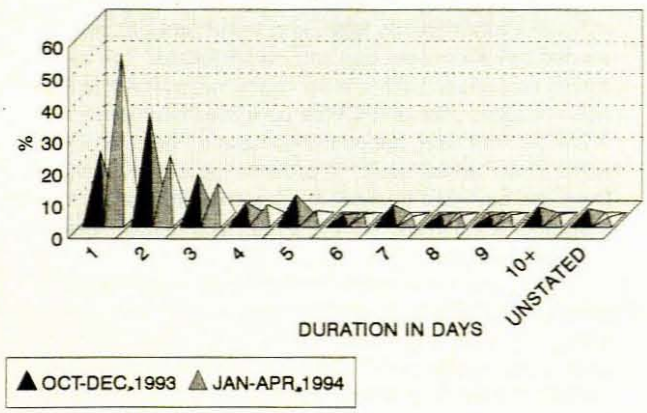


Fig. 3. Duration of hospital stay.

Discussion

The findings of this study reaffirm those of other workers that MVA is a safe, effective, reliable and acceptable method for treatment of incomplete abortion. They also show that it can contribute toward the conservation of health care system resources, and improve the quality of abortion ca and the reproductive health of women in Malawi if used properly.

The fact that the uterine sizes were smaller than the recalled periods of amenorrhoea supports Kizza and Rogo's[14] finding of the necessity for clinical assessment o uterine size rather than reliance on the gestational periods to determine who is suitable for MVA and who is not. Secon ly, we feel that MVA can be used for even more advanced gestations than recommended by the manufacturer and distributor of the equipment, i.e. IPAS and the WHO,[15] provided the physician performing the procedure is experienced and ensures that most of the placenta is out and does a proper assessment beforehand. This would be very useful, especially in Africa where a fair proportion of women with incomplete abortion have gestational ages more than 12 weeks.[3-5,16,17] It wil minimise even further the proportion of patients requiring evacuation with sharp curettage under general anaesthesia, and thus reduce the overall cost of abortion care.

The cannulas used most often were numbers 8, 10 and 12. For a developing country like Malawi, with a limited health budget, this observation is extremely useful. It woul be most cost effective to buy more of the sizes that will be used/needed most and fewer of the others.

As reported by the other workers, the procedure, especially when performed for the treatment of incomplete abortion, can be undertaken safely without analgesia, sedation or general anaesthesia in the majority of patients.[10,14,18,19] Only 10.7% of the total study group require or were given pain-relieving medication. However, for this t be realised, there is a need for adequate and appropriate counselling prior to and during the procedure. This is an important aspect of the technique, as obviation of the need for analgesia, sedation or anaesthesia reduces the overall hospital stay, the need for pre-procedure preparations and intensive post-procedure observations, the amount and therefore the cost of anaesthetic drugs, the staff needed an the total cost of treating a woman with abortion.[10,13,14,18,19] However, there is need for case control studies, preferably multicentre ones, to determine the need or otherwise for pain relief during the procedure and to assess blood loss and complications, before our observations and those of a few other workers can be adopted.[7,10,19]

Most patients were happy with the procedure, particularly because it enabled them to go home soon thereafter. For congested wards like ours, such a programme would be very welcome since, as stated earlier, abortion is the main indication for acute gynaecological admissions in most of the health facilities in Africa. As a result, there have been continued decreases in the bed occupancy rates in the gynaecological ward and in the duration of hospital stay for patients with incomplete abortion. When and if it becomes possible to perform MVAs in a completely outpatient setting, as we plan to do eventually, the bed occupancy rates will definitely fall further, thus leading to a further reduction in the cost of abortion care.

The fact that no major complication resulted from the use of MVA during the period of the study is very encouraging, and confirms the findings of other workers in respect of its safety, effectiveness and reliability in the treatment of incomplete abortion.[10,13,17,20] In a similar period, before the

introduction of MVA, we would have had 6 or 7 deaths due to abortions in our unit and perhaps 60 to 100 others with moderate to severe morbidity.[1,8] The proportion of patients who required re-evacuation in our study is lower than that reported by Kizza and Rogo.[14] The lack of sepsis among our patients may be explained by the fact that they were treated promptly either upon admission or the following morning (unlike before when they could wait for up to 3 days), and that we put all our patients on prophylactic antibacterial treatment.

In conclusion, we would like to recommend that MVA be expanded urgently to other health facilities within Malawi, so that more women may benefit, given that abortion is a major problem country-wide.

We wish to thank the IPAS for its support in introducing the MVA technique in Blantyre, Malawi.

We thank the officials concerned at the Ministry of Health headquarters, Queen Elizabeth Central Teaching Hospital, and the Department of Obstetrics and Gynaecology, University of Malawi, for their respective permission and support.

To all the staff involved in this programme (nurses, doctors, pharmacists, storekeepers, laundry staff, etc.), we are most grateful for their enthusiasm and support.

This study is dedicated to the many women in Malawi who continue to suffer and lose their lives through abortion in the course of fulfilling their 'life's obligation', i.e. reproduction.

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