Research Square

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Promoting evidence-based clinical practice for women in abortion situations after the implementation of a surveillance network: a situational analysis in a Brazilian university hospital

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Abstract

Background

Manual vacuum aspiration (MVA) and medical abortion (MA) can be used to treat women with abortion complications and the choice of the evacuation method is essential for the safe management of abortion.

Objective

to evaluate the frequency of use of MVA and MA and investigate the associated factors after the installation of a surveillance network of good practices (MUSA Network) in a university hospital in Brazil.

Methods

A cross-sectional study of women admitted for abortion at UNICAMP Women's Hospital, Brazil, between July 2017 and November 2020. The dependent variables were the rates of MVA and MA. The independent variables were clinical and sociodemographic data. The Cochran-Armitage test, chi-square test, Mann–Whitney test and multiple logistic regression were used for statistical analysis.

Results

474 women were included. Most women (91.35%) had undergone uterine evacuation: uterine curettage (78.75%), MVA (9.46%) and MA (11.54%). We observed a significant tendency toward an increase in the use of MVA (Z = 9.85; P <0.001). Factors independently associated with performance of MVA were admission in 2020 (OR 64.22; 95% CI 3.79–1086.69) and lower gestational age (OR 0.837; 95% CI 0.724–0.967). The only factor independently associated with MA was a higher level of education (OR 2.66; 95% CI 1.30-5.46).

Conclusion

the use of MVA increased after the installation of a surveillance network for good clinical practices. Being part of networks that encourage the use of evidence-based practices is an opportunity for health facilities to increase access to safe abortions.

Background

Unsafe abortion is a public health concern and one of the main causes of maternal mortality worldwide [1]. It has a higher incidence in developing countries, occurring in 37 out of every 1000 pregnant women compared to 27 out of every 1000 pregnant women in developed countries [2]. It is estimated that 208 million women become pregnant every year [2], and approximately 25% of all pregnancies end in abortion worldwide [3]. Among these, 22 million unsafe abortions are performed annually, leading to 47,000 maternal deaths due to complications [2]. In Brazil, where the law ensures the right to terminate a pregnancy only in cases of sexual violence, risk of maternal death, and fetuses with anencephaly, the avoidable morbidity and mortality persists [4]. It is estimated that one in five women up to 40 years of age has had an illegal abortion, with almost half of them having been hospitalized for

complications. With this, it is estimated that every year, 200 women die in the country because of unsafe abortions [5, 6]. Furthermore, as most women hospitalized for complications from unsafe abortions do not have health insurance, the annual expenditure to the government is estimated at approximately US$10 million [7].

Among abortion-related complications, there are some related to the clinical condition itself, such as an incomplete abortion with consequent massive hemorrhage [8], and those associated with unsafe induced abortion, such as cervical laceration, uterine perforation, and infection [6]. However, in women undergoing abortions, some complications occur as a result of the therapeutic procedures performed for uterine evacuation. Among these procedures, the one with the highest frequency of possible complications is cervical dilation followed by curettage [8]. Uterine perforation is the most common complication associated with cervical dilation. It occurs in approximately 2% of the cases [10] and is more frequent at higher gestational ages [9]. Another unwanted outcome after curettage is uterine synechiae. Studies estimate that approximately 90% of the cases of severe uterine synechia occur as a result of curettage performed to treat pregnancy complications, such as incomplete abortion [11, 12]. According to the Brazilian Ministry of Health, post-abortion curettage is the third most common obstetric procedure performed in public health facilities [13].

The choice of the uterine evacuation method is an important aspect in the provision of health services. Manual vacuum aspiration (MVA) and management of medical abortion (MA) should be used to treat women with complications associated with spontaneous and unsafe abortions. MVA for gestational losses of up to 14 weeks is the surgical technique recommended by the World Health Organization (WHO) and the International Federation of Gynecology and Obstetrics [1]. It is a procedure that can be performed in an average of 3–10 min at outpatient clinics with analgesics or local anesthesia [14]. Uterine evacuation induced exclusively with pharmacological drugs to terminate pregnancy is an alternative to avoid the risks associated with a surgical procedure. It has similar efficacy as that of surgical abortion in cases of early pregnancy [15], is safe and effective, and has been proven to be acceptable in low-resource settings [16].

According to the WHO, a standard of care is to identify priorities for providing information on evidence-based practice [17]. Surveillance systems can be used to improve the quality of care and help countries evaluate and monitor programs aimed at preventing unplanned pregnancies and maternal morbidity and mortality. Through data collection, abortion surveillance programs can monitor changes in clinical practice patterns and provide the data necessary to manage health policies [17, 18]. In a previous study, our research group demonstrated how a surveillance system was able to increase contraceptive use before hospital discharge in women who were hospitalized for abortion complications [19].

When an abortion is performed by a professional trained in providing adequate technical or ethical assistance, the procedure is very safe [4]. Choosing a method of uterine evacuation is essential for the safe management of abortion conditions [13]. Dilatation and curettage should be avoided whenever possible and replaced by other methods [8, 4]. The aim of this study was to evaluate the frequency of use of MVA and exclusively MA, and investigate the associated factors after the installation of a surveillance network of good practices in a university hospital in the southeastern region of Brazil.

Methods

The multicentric network MUSA - Women in Abortion Situations - is a network created by the Latin American Center for Perinatology (CLAP) to improve care for women undergoing abortions in Latin America and the Caribbean [20].

It includes several hospitals, called sentinel centers, which periodically send their data regarding the pregnancy cycle for registration in the Perinatal Computerized System (SIP), a software developed by CLAP that helps health facilities register data related to pregnancy and epidemiologic monitoring. Our institution, University of Campinas Women's Hospital (UNICAMP) is a tertiary referral hospital for cases of complications related to pregnancy in municipalities in the region and experiences an average of 250 births and 20 cases of first trimester pregnancy loss per month. Our hospital has been a sentinel institution of the MUSA Network since July 2017. The hospital follows the laws of Brazil regarding the legal termination of pregnancy, in which abortion is allowed only in cases of risk of maternal death, sexual violence, and fetal anencephaly [4].

The sentinel centers of the MUSA Network regularly provide information on maternal morbidity in early pregnancy loss, termination methods for uterine evacuations, incidence of complications related to pregnancy termination, incidence of preoperative antibiotic use, and prescription of contraception before hospital discharge. Through SIP, it is possible to carry out epidemiological monitoring and comparisons between different sentinel centers over time. Representatives from each sentinel center also hold regular online meetings to discuss the data collected, conduct scientific discussions on the topic of women's health in abortion situations, and encourage good clinical practices for safe abortion.

Data collection

This cross-sectional study was conducted between July 2017 and November 2020. The inclusion criteria were women admitted for abortion due to any cause and women of any age group who visited our hospital. The exclusion criteria included women with bleeding during pregnancy who did not have a confirmed abortion and women with ectopic or molar pregnancies. All participants who agreed to participate in the project signed a free and informed consent form. The research ethics committee of our institute approved this study (approval number CAAE: 93060618.9.1001.5404).

Dependent variables

- MVA
- MA with misoprostol: when there was no need for further uterine evacuation methods

Independent variables

The independent variables were age, education, marital status, living status, health records, number of pregnancies, number of births, number of abortions, body mass index (BMI), active smoking, illegal drug use, alcohol use, planned pregnancy, pregnancy resulting from contraceptive failure, date of admission for abortion, abortion for legal reasons, gestational age, presence of any complications, and admission data.

Sample size

This was a convenience sample, including all women who fulfilled the inclusion criteria and who signed the informed consent form from 07/01/2017 to 11/16/2020. We calculated the power of the sample using the estimate in a descriptive study with a categorical variable, setting the level of alpha significance or type I error at 5%, and the sample error at 5%. We calculated that the power of the sample to estimate the prevalence of MVA and medical methods for uterine evacuation were 99.4% and 97.3%, respectively.

Statistical analysis

Initially, a descriptive analysis of the data was performed. The calculated continuous variables were the mean, standard deviation, median, interval, and quartile. Relative frequencies were calculated for categorical variables. The Cochran-Armitage trend test was performed with quarterly analysis to assess whether there was a change in the rates of the use of MVA and MA. The chi-square (categorical variables) and Mann–Whitney (continuous variables) tests were performed to assess the factors associated with performing MVA and MA. Finally, to assess the independent factors associated with performing MVA and MA, two models of multiple logistic regression were constructed, with stepwise criteria for selecting variables. The level of significance was set at 5%. The software used for the analyzes was The SAS System for Windows (Statistical Analysis System, version 9.2. SAS Institute Inc., 2002-2008, Cary, NC, USA).

Results

During the study period, 474 women with a mean age of 30.01 years (± 7.48) and a median age of 30 (12–48) years were included. The mean gestational age was 11.03 weeks (± 3.56), and 30.38% of women did not have previous pregnancies. Most women did not use contraceptive methods (75.54%), and 69.85% of the pregnancies were unplanned. Abortion induced for legal reasons was conducted in 67/474 (14.14%) cases, and 66/67 (98.5%) cases were due to sexual violence. The mean and median BMI were 26.81 (± 5.85) and 25.72 (14.57–51.86), respectively. The details of the clinical and sociodemographic characteristics are shown in Tables 1 and 2.

Table 1
Clinical and sociodemographic characteristics of women in abortion situations - categorical variables (n = 474)

	n	%
Age[a]		
<20 years	31	6.55
20-29 years	204	43.13
30-39 years	182	38.48
40-49 years	56	11.84
Education[b]		
No education	3	0.64
Primary	84	17.83
Secondary	288	61.15
Higher	96	20.38
Marital status[c]		
Married	183	39.61
Cohabiting	87	18.83
Single	146	31.60
Other	46	9.96
Previous abortion[d]		
0	297	68.28
1	98	22.53
2	26	5.98
3	10	2.30
4	1	0.23
Planned pregnancy [e]		
Yes	329	69.85
No	142	30.15
Contraceptive Use[f]		
Non user	352	75.54
Hormonal	31	6.65

Missing data (a = 1; b = 1; c = 12; d = 39; e = 3; f = 8; g = 1)

	n	%
Barrier	8	1.72
IUD	69	14.81
Emergency	4	0.86
Natural	2	0.43
Legal Abortion		
Yes	67	14.14
No	407	85.86
Sexual Violence [g]		
Yes	66	13.95
No	407	86.05
Missing data (a = 1; b = 1; c = 12; d = 39; e = 3; f = 8; g = 1)		

Table 2
Clinical and sociodemographic characteristics of women in abortion situations - quantitative variables (n = 474)

Variable	Mean	SD	Median	Min	Max
Age [a]	30.01	7.48	30.0	12.0	48.0
Parity	1.58	1.59	1.0	0	11.0
BMI [b]	26.81	5.85	25.72	14.57	51.86
Gestational age [c]	11.03	3.56	10.36	2.14	24.71
Missing data (a = 1; b = 29; c = 8); BMI- body mass index					

Since the beginning of the evaluation period, 433 women (91.35%) had undergone uterine evacuation. The most commonly used method was uterine curettage performed in 341 cases (78.75%). MVA was performed in 41 women (9.46%). The MA method with misoprostol was performed in 50 women (11.54%). At least one complication was observed in 24/475 (5.06%) women, and all of them underwent curettage. We observed a significant tendency toward an increase in the use of MVA (Cochran-Armitage test: Z = 9.85; P <0.001); however, we did not observe a difference in the tendency of MA over the analyzed period (Cochran-Armitage test: Z = 1.35; P = 0.178) (Figure 1).

When analyzing the factors associated with MVA, it was observed that women with less education (p = 0.04), admitted in the year 2020 (p <0.01), without previous pregnancies (p <0.01), and with lower BMI (p <0.01), lower gestational age (p = 0.03), shorter duration of symptoms (p = 0.02), and higher hemoglobin levels (p = 0.04) underwent the procedure with greater frequency (data not shown). In the multiple logistic regression model, the

factors independently associated with the performance of MVA were admission in 2020 (odds ratio [OR] 64.22; 95% confidence interval [CI] 3.79–1086.69) and lower gestational age (OR 0.837; 95% CI 0.724–0.967) (Table 3). When analyzing the factors associated with a higher frequency of undergoing MA, it was observed that women with higher education selected this type of procedure more frequently (p = 0.03) (data not shown). In the multiple logistic regression model, the only factor independently associated with the medical method of abortion was a higher level of education (OR, 2.66; 95% CI 1.30–5.46) (Table 4).

Table 3
Factors associated with performing MVA - Multiple logistic regression (n = 381).

Variable	OR (95% CI)	p-value
Year of Admission		
2017	ref	
2018	1.00 (0.99 – 1.01)	1.000
2019	1.00 (0.99 – 1.01)	1.000
2020	64.22 (3.79 – 1086.69)	<0.001
Gestational Age	0.837 (0.724 – 0.967)	0.016
Abbreviations:		
CI, confidence interval; OR, odds ratio; ref, reference. Cases with missing variables were not included in the multiple analysis. Stepwise criteria for variable selection.		

Table 4
Factors associated with performing MA - Multiple logistic regression (n = 381).

Variable	OR (95% CI)	p-value
Education		
No education	2.21 (0.10–47.69)	0.675
Primary	1.01 (0.36-2.83)	0.984
Secondary	ref	
Higher (university)	2.66 (1.30– 5.46)	0.008
Abbreviations: CI, confidence interval; OR, odds ratio; ref, reference. Cases with missing variables were not included in the multiple analysis. Stepwise criteria for variable selection.		
MVA- manual vacuum aspiration; MA- medical abortion. Cochran-Armitage test: MVA: Z = 9.85, P <0.001; MA: Z = 1.35; P = 0.178		

Discussion

Our study showed an increase in the use of MVA and maintenance of MA rates since the establishment of a surveillance network of good practices for safe abortion (MUSA Network) in a university hospital. Being admitted in 2020 and having a lower gestational age were factors associated with increased use of MVA. A higher level of education was the only factor associated with a greater use of MA.

The choice of the uterine evacuation method influences the incidence of both short- and long-term adverse events. Efforts to replace uterine curettage with alternative methods are recommended in the WHO manuals [8]. Adverse events from curettage can occur immediately, such as in cases of uterine perforation. One study evaluated 706 women who underwent laparoscopic sterilization shortly after the first trimester uterine curettage. Among them, the surgical team suspected that some uterine perforation could have occurred in 0.28% of the cases; however, the rate of perforation verified during laparoscopy was 1.98%, which was seven times higher than that expected [15]. Complications of curettage can also be diagnosed. In a study that evaluated women who underwent hysteroscopy after 12 months of spontaneous abortion (86% performed curettage), the prevalence of synechiae was 19.1% [21]. In addition to changes in the menstrual cycle, such as amenorrhea, it was estimated that 7–40% of women with uterine synechiae were infertile [22, 23].

Currently, MVA is considered the technique of choice for surgical uterine evacuation in pregnancies of up to 12 to 14 weeks. It is a quick procedure that can be performed in outpatient clinics using less complex anesthetic procedures [8, 13]. It has been emphasized that the replacement of uterine curettage by MVA reduces the mortality rate from 1.23–0.07% [24]. A systematic review that analyzed complications related to MVA showed that less than 5% of women experienced hemorrhage without blood transfusion, less than 0.1% presented with uterine perforation or bleeding requiring blood transfusion, less than 0.5% were hospitalized, and only 3% had repeated aspirations, with no maternal deaths reported [25]. These results show that the use of MVA instead of curettage should play a major role in the strategy of improving care during abortions and should be encouraged in all health facilities [26].

The WHO suggests that whenever possible, the uterine curettage procedure with a rigid instrument should be replaced by MVA [8]; however, curettage is still widely used in Brazilian hospitals [13]. According to a national mixed methods study in Brazil, only 45% of women used MVA in legal abortion services [27]. In Honduras, an initiative undertaken to increase the use of MVA at the expense of curettage has not achieved the desired success. The main obstacles cited for an increase in the use of MVA were the lack of training, lack of adequate methods to control pain, and the reluctance of some physicians to abandon the use of traditional curettage [28]. A qualitative study of MVA utilization in Malawi showed that the lack of training and limited human resources are not the only factors preventing the increase in MVA use [29]. The authors report that addressing staff relationships and power dynamics that negatively impact MVA usage is equally important and that performing regular team meetings can improve communication between cadres and promote teamwork and performance [30, 31]. In the present study, we found a significant trend toward an increase in the use of MVA after the installation of a surveillance network in which one of the initiatives is to hold regular team meetings, which highlights the role of initiatives that promote changes in clinical practices for patient benefit.

Among the alternatives to surgical procedures, MA is considered an effective procedure, with success rates between 75% and 90% [32, 33, 34]. In the present study, MA was performed in 11.54% of cases, and there was no increase in use even after the establishment of a surveillance network for good practice. For comparison and contextualization purposes, in the United States, uterine evacuation performed exclusively with medications was used in approximately 40% of all abortions in 2018, with most patients being up to 9 weeks pregnant [35]. In Brazil, misoprostol is used for uterine emptying in hospitalized patients [4]. In comparison to surgical procedures, MA takes longer to complete [8], leading to a longer hospital stay; thus, it may not be the first choice for women or doctors. Higher levels of education in women in abortion situations may increase the possibility of uterine evacuation using medication. Follow-up after MA is based on self-recognition of signs and symptoms [3, 15]; thus, it is possible that health professionals believe it is more secure to recommend it to women who may have a greater capacity for recognizing alarm signs. In our study, approximately 20% of women had a higher educational level,

with a 2.3 times greater chance of receiving MA. These results are similar to those of Bolnga et al., who also reported a higher frequency of MA among women with a higher educational level [36].

This study had some limitations. First, it was a cross-sectional study; thus, a cause-effect relationship could not be established. Furthermore, it was not possible to differentiate provoked abortion from spontaneous abortion, except in cases of legal induction. Regarding MA, it was not possible to consider the influence of different doses of misoprostol used during the analyzed period. In addition, women had data analyzed only during the hospitalization period and were not followed up after discharge. However, we believe that the obtained results are valid. Recently, a Brazilian study showed that among Brazilian medical residents in Gynecology and Obstetrics, knowledge of MA is limited [37]. Inadequate training of physicians caring for patients experiencing abortion can be an obstacle to the use of safe techniques for uterine evacuation. Our study highlighted that a surveillance network of good clinical practices can play an important role in medical education and help improve the quality of care provided to women.

Conclusion

MA is still underutilized in our hospital, possibly because of the fear of complications in women who would be less capable of recognizing signs and symptoms of alarm. However, the use of MVA significantly increased after the installation of a surveillance network for good clinical practices (MUSA Network). Being part of networks that encourage the use of evidence-based clinical practices is an opportunity for health facilities to set their priorities, evaluate outcomes, and implement changes in health policies to increase access to safe abortions. Continuous monitoring of therapeutic indicators and continuous medical education can help reduce abortion-related morbidity and help improve the healthcare needs and rights of women.

Declarations

Ethics approval and consent to participate:

All participants who agreed to participate in the project signed a free and informed consent form. The research ethics committee of our institute approved this study (approval number CAAE: 93060618.9.1001.5404). All procedures were performed in accordance with relevant guidelines and regulations.

Consent to publication:

Not applicable

Availability of data and materials:

The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

Competing Interests :

None of the authors have any competing interest.

Funding information:

None

Author contributions:

NVJ, CE, BDK, PBFD, AAJ, CCN and LFB contributed to project development, data collection, study conception and design. NVJ, CE, BDK and LFB wrote the manuscript. NNVJ and LFB reviewed and edited the final version. All authors reviewed and approved the final manuscript.

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Figures

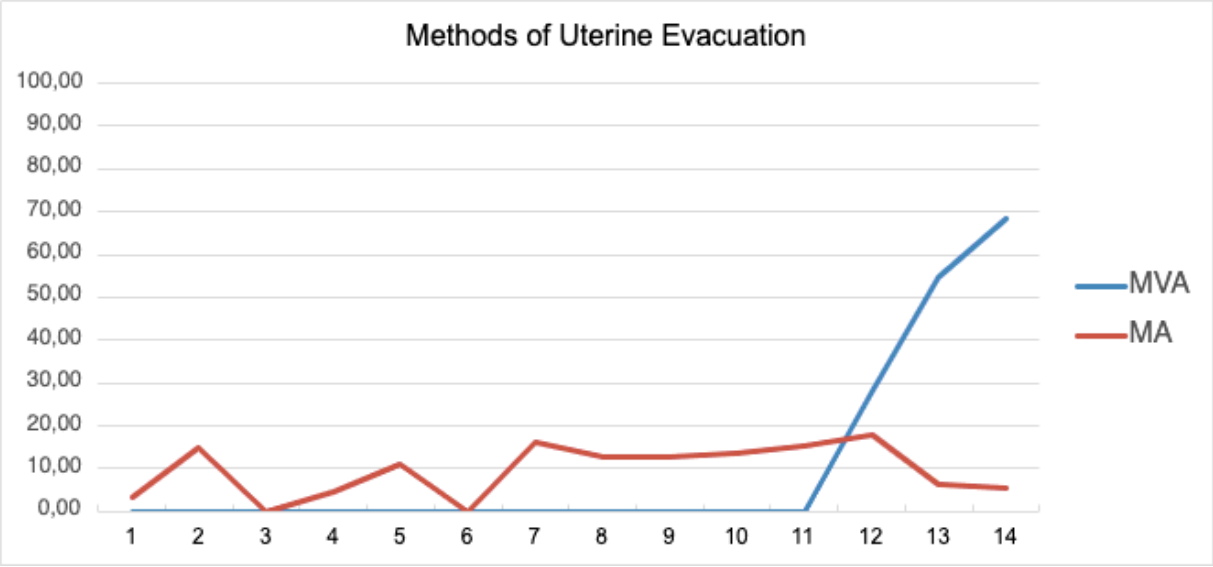

Figure 1

Methods of uterine evacuation between July 2017 and November 2020 by trimestral period. MVA- manual vacuum aspiration; MA- medical abortion. Cochran-Armitage test: MVA: Z = 9.85, P <0.001; MA: Z = 1.35; P = 0.178