





Knowledge and Level of Use of Misoprostol by Health Care Providers in the Maternity Wards of South Kivu in the Practice of Obstetrics

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Abstract

Post-partum haemorrhage (PPH) is one of the leading causes of maternal death in sub-Saharan Africa. In developing countries, PPH is responsible for about 30% of maternal deaths. The main causes of PPH are uterine atony, placental implantation anomalies and coagulation disorders. Acting on the causes of post-partum haemorrhage would significantly reduce maternal mortality. To prevent PPH, the World Health Organization (WHO) recommends the use of uterotonics as a preventive measure. Although parenteral Oxytocin is recommended as the first line Oxytocic for the prevention of PPH, the use of misoprostol is increasingly used in gynaecology and obstetrics, not only for the prevention of postpartum haemorrhage, but also for many other obstetric indications. The aim of this study was to assess the knowledge and level of use of misoprostol by healthcare providers in the gynaecology and maternity departments of South Kivu in the practice of gynaecology and obstetrics. **Materials and Methods:** We conducted a descriptive study from January 03 up to February 04, 2023. The study of population was made up of healthcare workers in South Kivu. A questionnaire containing questions relating to socio-demographic informations and knowledge of misoprostol was prepared and encoded in the kobo collect software. To access the questionnaire, it was compulsory to read the research protocol and give consent by ticking the “yes” button. All those who ticked “no” were denied access to the questionnaire. The link was sent, with a request to take part in the survey, to groups in the social networks of doctors and midwives in South Kivu. For areas not covered by the internet, a printed format was distributed

and then encoded by data entry operators. For the paper format, respondents were also asked to indicate their consent by ticking the “yes” box. All the encoded data was automatically compiled on the server and then analysed and interpreted by the research team. **Results:** Nearly all (95.8%) healthcare workers in South Kivu knew about Misoprostol, and only 4.2% did not. The majority (90.1%) of healthcare workers had already used Misoprostol. Providers were aware of the obstetrical indications for Misoprostol, but in most cases, they did not know the dosage recommended by FIGO. For the prevention of post-Partum haemorrhage, only 39.9% use the correct dosage, 42.7% for the treatment of incomplete miscarriage and 49.3% for the treatment of post-Partum haemorrhage. 10% to 21% of providers know the indications of misoprostol but have no idea about dosage. Providers were aware of all routes of administration, but in most cases, they prescribed Misoprostol via the sublingual route (84.5%). The side effects observed by the providers were those already observed in other studies.

Keywords

Misoprostol, Postpartum Haemorrhage, Uterotonic

1. Introduction

Maternal mortality is a public health problem. Worldwide, 303,000 women die every year from preventable pregnancy-related causes. [1] Around 830 women die every day worldwide because of complications related to pregnancy or childbirth [2] Around 86% of maternal deaths worldwide are due to direct complications of pregnancy and childbirth, the main causes being postpartum haemorrhage (PPH), pre-eclampsia and eclampsia (PE/E), sepsis and unsafe miscarriage. [3] Nearly 60% of maternal deaths worldwide in 2015 occurred in 10 countries, including the Democratic Republic of Congo, (DRC) with a maternal mortality ratio (MMR) of 693 per 100,000 live births in 2015 (22,000 maternal deaths), the 10th highest in the world. [3] The province of South Kivu records the highest mortality rates in the country, particularly among mothers and children. [4] Most maternal deaths occur during labour, delivery, and the immediate post-partum period (the first 24 hours after delivery). Post-partum haemorrhage (PPH) is one of the leading causes of maternal death in sub-Saharan Africa, accounting for 30% of maternal deaths in developing countries. [2] The main causes of PPH are uterine atony, placental implantation anomalies and coagulation disorders [2]. Acting on the causes of post-partum haemorrhage would significantly reduce maternal mortality. To prevent PPH, the WHO recommends the use of uterotonics as a preventive measure. The WHO standard is “All women should benefit from the administration of an uterotonic at delivery to prevent PPH” [5]. Although the World Health Organization recommends the use of oxytocin for the prevention of PPH, the use of misoprostol is increasingly common in gynaecology and obstetrics, not only for the prevention of

post-partum haemorrhage, but also for several other obstetric indications. The use of misoprostol is becoming more common due to the advantages of ease of storage, shelf life and the potential for sublingual administration. The WHO recommends the use of misoprostol when oxytocin is not available [6]. For years, the only uterotonics that were available and could be used in African countries were oxytocin and ergometrine. However, the use of these drugs in Africa is limited by several factors. Firstly, they deteriorate rapidly and lose their potency under the high temperatures in African countries, unless they are stored in refrigerators, which are not often available in these countries. More than 50% of the potency of medicines can be due to poor storage of these medicines in African countries. Secondly, it is necessary to give ergometrine and oxytocin intravenously or intramuscularly or intramuscularly, a condition that is not easy to meet, given the poverty of resources in many African countries. Thirdly, and most importantly, these drugs are often ineffective because of their point of impact. While they are effective in stimulating uterine contractions, they have contractions; they have very little effect on the cervix. This means that in conditions where cervical dilation, such as labour in the second during the second trimester, they will have limited effectiveness and usefulness. Prostaglandins are effective for uterine contractions as well as cervical dilation of the cervix. [7] Misoprostol has many advantages: the fact that, being an E1 analogue, it has no effect on the bronchial tubes or blood vessels: it maintains a stable condition in relation to heat and can be stored for several years without active orally, vaginally, sublingually, and rectally, sublingual and rectal routes; it has limited side effects. Thanks to all these characteristics, misoprostol is well suited for use in African countries and is well placed to contribute to reducing the high rate of maternal mortality in the region [7].

The aim of this study is to assess the knowledge and level of use of misoprostol by health care providers in the Gynaecology and maternity wards of South Kivu in the practice of gynaecology and obstetrics.

2. Materials and Methods

2.1. Study Design

We conducted a descriptive study over a period from January 03 to February 04, 2023, in the Democratic Republic of Congo, in the South Kivu province. South Kivu province comprises eight administrative territories and 34 health zones. It has 368 health facilities. The present study was carried out in all 34 health zones of South Kivu. A questionnaire containing questions relating to socio-demographic informations and knowledge of misoprostol was prepared and encoded in the kobo collect software. To access the questionnaire, it was compulsory to read the research protocol and give consent by ticking the “yes” button. All those who ticked “no” were denied access to the questionnaire. The link was sent, with a request to take part in the survey, to groups in the social networks of doctors and midwives in South Kivu. For areas not covered by the internet, a printed format

was distributed and then encoded by data entry operators. For the paper format, respondents were also asked to indicate their consent by ticking the “yes” box. All the encoded data was automatically compiled on the server and then analysed and interpreted by the research team.

2.2. Study Population

The study population consisted of healthcare workers, doctors, and midwives, in South Kivu province.

2.3. Sampling

We used an occasional non-probability sample of 213 health care providers, doctors, and midwives, working in gynaecology and maternity services, who agreed to answer to our survey questionnaire in the health facilities of South Kivu.

2.4. Study Variables and Operational Definitions

The dependent variable in this study was the use of Misoprostol by healthcare workers.

The independent variables included the socio-demographic profiles of respondents, and providers’ knowledge of Misoprostol.

2.5. Data Collection Plan

Data were collected using an electronic questionnaire set up in the Kobo-collect application. The questionnaire was then sent to healthcare workers in South Kivu Province. The questionnaire was composed of socio-demographic characteristics, health personnel’s knowledge of uterotonics and their practices.

2.6. Data Management and Analysis

Data were collected using the Kobo collect platform, then transferred into Microsoft Excel 2016, which enabled us to clean up the data collected in the field, and subsequently analysed using SPSS (Statistical Package for the Social Sciences) version 23. Quantitative variables were summarized by the mean and their standard deviation, and qualitative variables were presented in the form of frequency tables and their percentages.

2.7. Ethical Considerations

The research protocol was approved by the Bukavu provincial health ethics committee. A note explaining the objectives of the study and the research protocol preceded the questionnaires. A request for consent was then proposed and only after ticking the “yes” option was the questionnaire processed and participants could then take part in the survey. Confidentiality of information was guaranteed.

3. Results

The results in **Table 1** show that 33.8% of the healthcare workers interviewed worked in hospitals, 28.2% in health centers and general referral hospitals respectively. Almost half of the staff surveyed were nurses (45.5%), general practitioners (37.1%) and obstetricians and gynaecologists (only 6.6%). About professional experience, 37.6% of respondents had more than 10 years' professional experience, while 27.7% had less than 5 years. We noted that most (71.4%) of the facilities perform more than 16 deliveries per month.

In **Table 2**, we note that half (48.8%) of the respondents were aged between 26 and 35, and the majority were men (65.3%) versus 34.7% of women.

Table 1. General characteristics of surveyed providers.

Parameters	N = 213 (%)
Provider health structure	
Health center	60 (28.2)
Hospital	72 (33.8)
Private clinic or polyclinic	15 (7.0)
General reference hospital	60 (28.2)
Provincial hospital or university clinic	6 (2.8)
Health zone	
Rural	149 (70.0)
Urban	64 (30.0)
Professional category	
Nurse	97 (45.5)
Gynecologist	14 (6.6)
General practitioner	79 (37.1)
Midwife	12 (5.6)
Other	11 (5.2)
Professional experience (years)	
0 - 4	59 (27.7)
5 - 9	74 (34.7)
>10	80 (37.6)
Average number of births per month	
1 - 5	8 (3.8)
6 - 10	30 (14.1)
11 - 15	23 (10.8)
>16	152 (71.4)

Table 3 shows that almost all (95.8%) healthcare professionals knew about Misoprostol, and only 4.2% did not. We noted that the majority (90.1%) of healthcare workers questioned had already used Misoprostol. Among the indications, we noted that Misoprostol was used for induction of labor, treatment of post-partum haemorrhage (PPH), prevention of PPH, and treatment of miscarriage in 71.8%, 57.3%, 56.3% and 49.3% respectively.

In **Table 4**, in relation to the prescribed dosage, we note that 63.8% of healthcare workers use the dosage of 50 micrograms of misoprostol for labor induction, and 1.9% only use the dosage of 25 micrograms for labor induction. 34.7% use 200 micrograms for medical termination of pregnancy, and only 12.7% use the 400 microgram dosage. The majority, 51.2%, use 50 micrograms of misoprostol for cervical ripening before an instrumental procedure, while 7% use 400 micrograms for ripening before an instrumental procedure. For the prevention of

Table 2. Socio-demographic characteristics of surveyed healthcare personnel.

Parameters	N = 213 (%)
Gender	
Female	74 (34.7)
Male	139 (65.3)
Age (years)	
18 - 25	10 (4.7)
26 - 35	104 (48.8)
36 - 50	77 (36.2)
>50	22 (10.3)

Table 3. Healthcare professionals' knowledge of Misoprostol.

Parameters	N = 213 (%)
Do you know Misoprostol	
No	9 (4.2)
Yes	204 (95.8)
Use of Misoprostol	
No	21 (9.9)
Yes	192 (90.1)
Indication(s) for Misoprostol use	
Induction of labour	153 (71.8)
Treatment of postpartum haemorrhage	122 (57.3)
Prevention of post-partum haemorrhage	120 (56.3)
Treatment of incomplete miscarriage and miscarriage	105 (49.3)
Cervical maturation prior to instrumental procedure	60 (28.2)
Medical miscarriage	95 (44.6)

Table 4. Dosage of Misoprostol prescribed by providers.

Characteristics	N = 213 (%)
Induced labor (μg)	
200	39 (18.3)
400	5 (2.3)
50	136 (63.8)
25	4 (1.9)
N/A	29 (13.6)
Medical miscarriage (μg)	
200	74 (34.7)
400	27 (12.7)
50	38 (17.8)
600	29 (13.6)
N/A	45 (21.1)
Cervical ripening before an instrumental procedure (μg)	
200	37 (17.4)
400	15 (7.0)
50	109 (51.2)
600	7 (3.3)
N/A	45 (21.1)
Cervical ripening before an instrumental procedure (μg)	
200	40 (18.8)
400	31 (14.6)
50	14 (6.6)
600	85 (39.9)
N/A	43 (20.2)
Treatment of incomplete miscarriage (μg)	
200	62 (29.1)
400	52 (24.4)
50	21 (9.9)
600	39 (18.3)
N/A	39 (18.3)
Treatment of post-partum haemorrhage	
200	33 (15.5)
400	25 (11.7)
600	15 (7.0)
800	105 (49.3)
N/A	35 (16.4)

post-partum haemorrhage, 39.9% use 600 micrograms, 18.8% use 200 micrograms and 14.6% use 400 micrograms. In the treatment of incomplete miscarriages, 29.1% use 200 micrograms, 24.4% use 400 micrograms of misoprostol, and 18.3% use 600 micrograms. For the treatment of post-Partum haemorrhage 49.3% use 800 micrograms of Misoprostol, 15.5% use 200 micrograms of Misoprostol, 11.7% use 400 micrograms, and 7.0% use 600 micrograms of Misoprostol.

The results in **Table 5** show that in most cases, providers prescribed Misoprostol by the sublingual route (84.5%), the other routes being intrarectal (57.3%) and intravaginal (47.5%). The oral route was the least prescribed (27.2%). Side effects observed by providers included nausea or vomiting (27.2%), headache (24.9%), fever (24.9%), chills (22.2%), dry mouth (19.2%), diarrhea (13.1%) and somnolence (4.7%).

4. Discussion

We conducted a descriptive study from January 03 to February 04, 2023, to determine providers' level of knowledge about misoprostol and their use of misoprostol in obstetrics. The study of population consisted of 213 gynaecologists and obstetrics providers in health facilities in South Kivu. The results of this study showed that 33.8% of the healthcare staff surveyed worked in hospitals, and 28.2% in health centers and general referral hospitals respectively. This distribution is explained by the fact that most maternity units are in health centers and general hospitals. Although health centers are the most numerous, they do not all have maternity units. Only referral health centers are authorized to have a maternity unit for low-risk pregnancies.

Table 5. Misoprostol route of use.

Characteristics	N = 213 (%)
Routes of Misoprostol administration used by providers	
Intra rectal	122 (57.3)
Intra vaginal	101 (47.4)
Oral	58 (27.2)
Sublingual	180 (84.5)
Side effects observed	
Nausea or vomiting	58 (27.2)
Headache	53 (24.9)
Fever 53	53 (24.9)
Chills	47 (22.1)
Thirst or dry mouth	41 (19.2)
Diarrhea	28 (13.1)
Drowsiness	10 (4.7)

We founded that almost all the staff surveyed (95.8%) were familiar with misoprostol and had already used it at least once (90.1%). The people surveyed were familiar with all the indications for misoprostol and had used it for all indications. The use of misoprostol in reproductive health has been the subject of numerous around the world, and there is broad agreement that it is more effective than other treatments [7]

About the dose prescribed, we founded that, depending on the indications, 1.9% to 42.7% of healthcare professionals use the correct dose according to FIGO recommendations. FIGO recommends using 25 micrograms for induction of labour, 400 micrograms for medical termination of pregnancy, 400 micrograms for maturation before an instrumental procedure, 600 micrograms for prevention of post-partum haemorrhage, and 400, 600 or 800 micrograms to treat incomplete miscarriage, 800 micrograms of misoprostol in the treatment of post-partum haemorrhage [8]; This means that most providers are not using the correct dose according to FIGO recommendations. Okonofua F. also found that the correct use of misoprostol was poorly understood by African clinicians. [7] The misuse of misoprostol in Africa compared to other regions of the world is due to several reasons, the most important being the lack of being the lack of knowledge of the drug by service providers and health policy decision-makers. Many service providers in Africa have limited knowledge of the benefits of the drug. The situation is further complicated by the fact that the drug is not always patented, which will authorise its use in reproductive health in several African countries. Advertising inserts showing how to use it in reproductive health are available, which limits the ability of clinicians in developing countries to use the drug for this purpose. [7] This lack of knowledge about the dosage of misoprostol may affect the effectiveness of the treatment. In fact, it is essentially the pharmacokinetics of misoprostol, the route of administration and the dose that determine the rate of efficacy [9].

5. Conclusion

Almost all providers were familiar with misoprostol and its various indications in obstetrics, and had used it at least once. However, less than half of providers knew the exact dosage for each indication. This lack of knowledge of misoprostol dosage may affect the effectiveness of the treatment.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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