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Misoprostol in prevention of postpartum hemorrhage

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Abstract

Misoprostol, an E1 prostaglandin analogue, induces uterine contractions and, because of this property. misoprostol has proven to be effective in preventing and treating postpartum hemorrhage (PPH) resulting from the failure of the uterus to contract fully after delivery. In this study we tried to demonstrate the efficacy of misoprostol in preventing PPH.

Patients and methods: we collected a sample of 500 women who attended Al-Batool teaching hospital in the period from July 2022 to January 2023. We collected the informations by direct interview through a prepared written questionnaire.

Results: 500 women was enrolled in the study, 4.8% had PPH despite the usage of misoprostol. all them used the rectal route. We found significant difference between the fibroid and the PPH ($P < 0.001$).

Conclusion:

There significant lower incidence of PPH in misoprostol intakers.

Keywords: misoprostol, post-partum hemorrhage.

بسم الله الرحمن الرحيم

وَآخِرُ دَعْوَاهُمْ أَنِ الْحَمْدُ لِلَّهِ رَبِّ الْعَالَمِينَ ﴿١٠﴾

Acknowledgement

(And another that their case Praise be to Allah)

You have succeeded in passing your plan of effort and the seal of your quest is only thanks to him.

..to my mother

Thank you, thank you for your smile, which gives you strength in the face of life

To my dad

We have been known by your name more than ours, the certificates of assets are our first victory…

Without the grace of God and my parents, we wouldn't be here To the comrades of the first step and the penultimate step To those who in the lean years were clouds and rain.

I am gratefulI am pleased to extend my sincere thanks and appreciation to the research supervisor **(Dr. Raghad Kamel)**. This is due to all the education, diligence and mastery it provides in performing its mission, and God grant success

Introduction

In 2015, approximately 303,000 women worldwide died during pregnancy and/or due to childbirth complications and almost all in low to middle income countries. The main causes were post-partum haemorrhage (PPH), sepsis, pre-eclampsia or eclampsia, complications arising at the time of birth and unsafe abortion. All of these causes are, to a large extent, preventable (1). Uterine atony refers to the corpus uteri myometrial cells inadequate contraction in response to endogenous oxytocin that is released in the course of delivery. It leads to postpartum hemorrhage as delivery of the placenta leaves disrupted spiral arteries which are uniquely void of musculature and dependent on contractions to mechanically squeeze them into a hemostatic state. Uterine atony is a principal cause of postpartum hemorrhage, an obstetric emergency. Globally, this is one of the top 5 causes of maternal mortality PPH alone accounts for nearly one quarter of all maternal deaths worldwide (2).

Oxytocin (administered intravenously or intramuscularly) is recommended for the prevention of PPH, but when oxytocin is not available, misoprostol, a medication available in tablet form (600 mcg oral) can be used as an alternative (2). Misoprostol is a safe alternative for the prevention of PPH when administered immediately after the birth where oxytocin is not available. Misoprostol is available internationally in 200mcg tablets. Therapeutic or preventive doses for PPH are usually administered as 3 tablets (600mcg) or 4 tablets (800 mcg). Misoprostol can be self-administered or administered by a trained community health worker (CHW) or traditional birth attendant (TBA) (4).

Misoprostol, an E1 prostaglandin analogue, induces uterine contractions and, because of this property, has several important uses in women's reproductive health programs. Originally registered for preventing gastric ulcers due to chronic use of

nonsteroidal anti-inflammatory drugs, misoprostol has proven to be effective in preventing and treating postpartum hemorrhage (PPH) resulting from the failure of the uterus to contract fully after delivery (5).

The efficacy of misoprostol for PPH prevention has been well documented over the past decade. This body of knowledge resulted in the addition of misoprostol to the World Health Organization's (WHO) Model List of Essential Medicines (EML) in 2011 for PPH prevention (600-µg oral dose). The evidence on misoprostol for PPH treatment shows that it is effective in curbing excessive postpartum bleeding and suggests that misoprostol can fill a service delivery gap in settings where women and providers are unable to access oxytocin (6).

Aim of study

To identify the role of misoprostol in the prevention of post-partum hemorrhage in women attending al-batool teaching hospital in Diyala province in Iraq.

Patients and methods

This is a cross sectional study. It was conducted in the period from July 2022 to January 2023. We collected 500 patients who have a risk factors for developing PPH (previous bleeding, gestational DM, preeclampsia, placenta previa, polyhydramnios, anemia, multiple pregnancy, fibroid) and took misoprostol as prophylaxis . We collected the sample from the patients who attend Al-Batool teaching hospital. Every women took misoprostol were eligible for study and we excluded the patients who have actual cause (retained piece, iatrogenic injury, thrombosis, etc). We collected informations about age, weight, mode of delivery, any hemorrhage, chronic diseases, etc. we collected the informations using prepared written questionnaire and by direct interview with the patients. We preserved the privacy and we coded the patients for the reasons of confidentiality and risk of bias.

Statistical analysis

SPSS Version 25 was used for the description of the data. We expressed the quantitative data by arithmetic mean, standard deviation and mode and the qualitative data by frequencies. Chi square was used to identify the association between the variables when P value less than 0.05 considered significant.

Results

The mean age of the patients was 27.79 ± 6.499 years. Their Number of previous pregnancies is demonstrated in table 1.

Table 1. Number of previous pregnancies

Gravida	Frequency	Percent%
0	4	0.8
1	107	21.4
2	122	24.4
3	97	19.4
4	76	15.2
5	49	9.8
6	20	4.0
7	11	2.2
8	8	1.6
9	2	0.4
10	4	0.8
Total	500	100%

As shown in table 1 the majority of cases were gravida 1,2 and 3.

10.2 % of them suffered gestational diabetes mellitus, 71.8% suffered anemia less than 11 g/dL, 24% of them have placenta previa and 19.8% of them suffered preeclampsia during their current pregnancy.

15% of them have history of misoprostol intake in the previous pregnancies and table 2 summarize the causes of intake.

The causes of previous misoprostol intake are summarized in table 2.

Table 2. Causes of misoprostol intake

Causes	Frequency	Percent%
Post-Partum hemorrage	41	57.7
Post-abortion	30	42.3
Total	71	14.2

As shown in table 2, 57.7% took misoprostol after PPH and the rest due to post abortion bleeding.

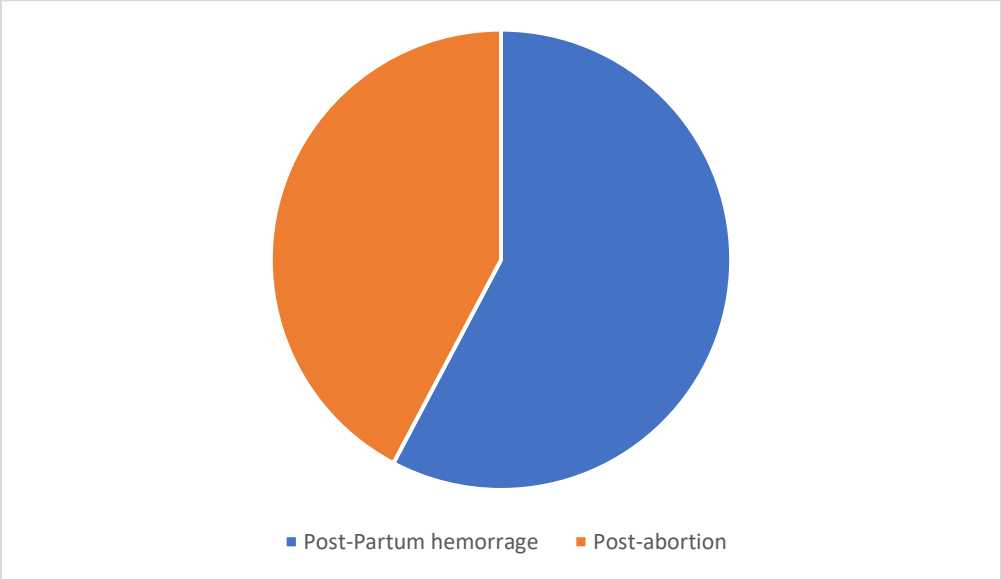

Figure 1. causes of misoprostol intake

25.4% have polyhydramnios, and only 1.8 % of them have uterine fibroids.

4.8% of them suffered PPH as in table 3.

Table 3. Post-partum hemorrhage

Bleeding	Frequency	Percent%
No	467	95.6
Yes	24	4.8
Total	500	100.0

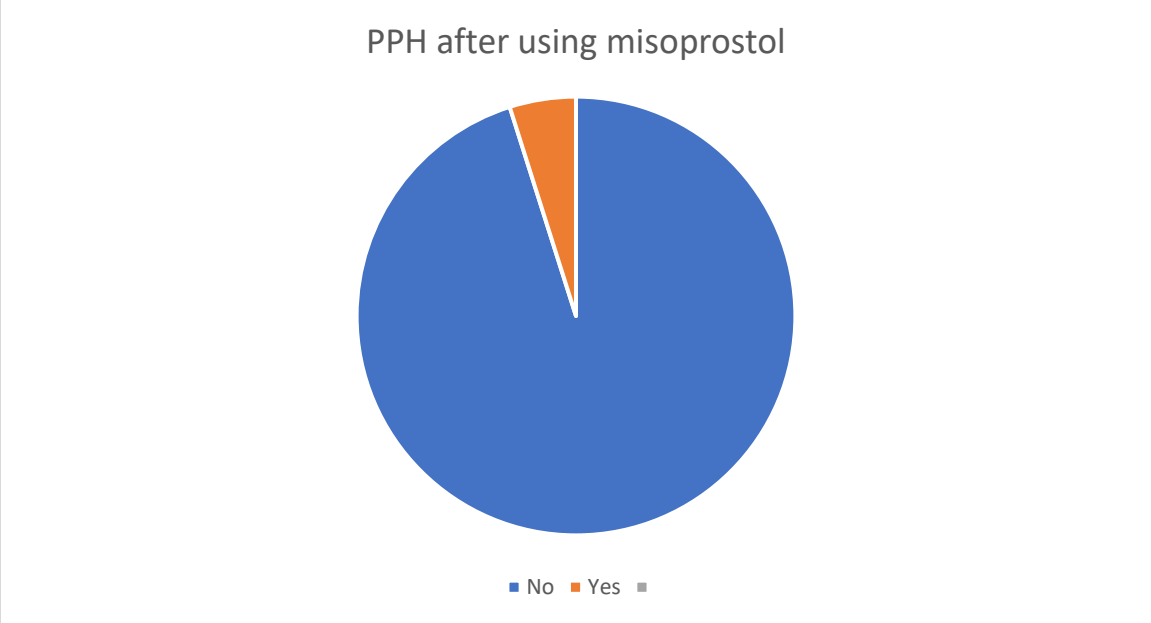

Figure 2. PPH after using misoprostol

As shown in table 3, 95.6% of them didn't experienced PPH after takin misoprostol which is significant compared to the normal range of PPH (4-11%).

And there was a statistical significant difference between the PPH incidence and the existence of uterine fibroids as shown in table 6.

Table 4.

Bleeding		Hx of uterine fibroid No	Yes	Total	Sigificance
Post-partum hemorrahge	No	476	3	376	P < 0.003
	Yes	24	6	124	
Total		491	9	500	

As shown in table 4 there was strong association between the risk of PPH and uterine fibroid.

Discussion

The published literature on misoprostol for prevention and treatment of PPH, coupled with growing program experience worldwide, offers strong support for its use in PPH care. Use of various misoprostol doses and routes by providers is ad hoc in many places. However, the largest amount of clinical data supports the safety and efficacy of a 600 μg oral dose for prevention. As new regimens and service delivery models are tested, the international community needs to make a concerted effort to update recommendations and promote evidence-based guidelines and practices. Ministries of Health interested in promoting misoprostol in PPH programs can establish a dedicated supply system in public facilities and develop training programs for healthcare providers [6,7].

In our study we selected 500 women used misoprostol in their last pregnancy to determine the efficacy of the drug in preventing PPH. We found that 95.2% of them have no bleeding and 4.8% experienced bleeding. We couldn't investigate the causes of bleeding thoroughly because most of them don't know the cause. This is lower than usual public percentage of PPH which is about 18% of all pregnancies [8], and this support the role of misoprostol in prevention.

We also found strong association between the existence of uterine fibroids and the PPH ($P < 0.001$).

Several studies are performed about the efficacy of misoprostol for management of postpartum hemorrhage and most of them have shown the effectiveness of misoprostol for management of postpartum hemorrhage. This study also showed that misoprostol can decrease postpartum hemorrhage and need to excessive oxytocin [9,10].

Our findings are consistent with the findings of Mansouri et al [11] and Mirteimouri et al [12] and contradicts with the findings of Langenbach et al [13], Smith et al [14] and Diadhiou et al [15].

The 24 women (4.8%) who experienced bleeding despite taking misoprostol may misuse the drug or they used lower dose and this is consistent with findings of Mobeen et al [16].

Conclusion and recommendations

We found significant decrease in the incidence of PPH in using misoprostol in preventing post-partum hemorrhage in women in Diyala. We recommend conducting more studies to decide the route of administration for the drug.

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