



Research Article

Knowledge of Midwives toward Misopristol in the Prevention of Postpartum Hemorrhages at Community Level in Khartoum State in Sudan

Kunna A¹, Musa IDM¹, Ismail KS², Elkheir HA^{3*}, Enour S¹, Taha U² and Kheiri SA¹

¹Department of Obstetrics and Gynecology, University of Bahri, Khartoum, Sudan

²Department of Obstetrics and Gynecology, Omdorman Islamic University, Khartoum, Sudan

³Omdorman Maternity Hospital, Central Laboratories, Khartoum, Sudan

Abstract

A descriptive, prospective, cross-sectional and a community-based study; carried out among community midwives to assess their knowledge toward "Misopristol" in Preventing Postpartum Hemorrhage (PPH), specifically, in terms of its role in postpartum hemorrhage, as well as, the probable side effects of the drug. The study was conducted in Khartoum State; which consists of three major towns, namely; Omdurman, Bahri and Khartoum - the capital of Sudan- where the residents mostly have urban life style. A total of 226 community midwives were included, 96 out of total (42.5%) had ages of 41-50 years, 92(40.7%) had experience of 11-20 years, and those who found to receive training course were 69(30.5%). A majority of them 181(80.1%) answered positively, when inquired about Misopristol. Data was collected by trained data collectors -after a prior consent- during the period from 1st of Feb to 1st of July 2015, via using a pre-designed questionnaire fulfilled by direct interviews with midwives managed by the author and was analyzed by using the computerized program; Statistical Package for Social Sciences (SPSS), then results were presented as tables and figures. Eventually, the study came to a conclusion that, midwives showed a higher level of knowledge regarding indications of Misopristol usage; they had a moderate level of knowledge pertaining, both, diagnosis of

*Corresponding author: Akram Elkhier Hassan, Omdorman Maternity Hospital, Central Laboratories, Khartoum, Sudan, Tel: +249 913364999; E-mail: akramalk@yahoo.com

Citation: Kunna A, Musa IDM, Ismail KS, Elkheir HA, Enour S, et al. (2019) Knowledge of Midwives toward Misopristol in the Prevention of Postpartum Hemorrhages at Community Level in Khartoum State in Sudan. J Reprod Med Gynecol Obstet 4: 022.

Received: April 23, 2019; **Accepted:** May 14, 2019; **Published:** May 21, 2019

Copyright: © 2019 Kunna A, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

postpartum hemorrhage and complications of Misopristol when used in pregnant ladies. On the other hand, their knowledge about the- drug- side effects was quite poor.

Keywords: Midwives; Misopristol; Postpartum hemorrhage PPH; Sudan; World Health Organization (WHO)

Introduction

In low-income countries, Postpartum Hemorrhage (PPH) is considered as a major cause of maternal death [1] and arguably, the most preventable. Attempts to reduce deaths from postpartum hemorrhage have been complicated by the fact that many deaths occur in out-of-hospital settings, or too quickly for the patient to be transferred to a health facility [1]. PPH is accounting for 30% and less than 10% in the developing world. According to the (WHO) statistics, it was suggested that more than 125,000 maternal deaths/year in developing countries are due to postpartum hemorrhage [2]. WHO recommended that active management of the third stage of labor -as a preventive measure- should be practiced in all women in labor, since the uterine atonia is a major risk factor of PPH that necessitates conventional uterotonics such as oxytocin, ergometrine and cyntometrine are the primary uterotonics used for prevention of PPH [2]. Though, "Misopristol" is a synthetic prostaglandin E1 analogue with uterotonic properties [3]. As a matter of fact, there are many obstacles hinder the distribution of these drugs to midwives practicing home- delivery such as: special storage requirements, requiring sterile needle and syringe in the area of outbreak of blood borne disease like HIV and hepatitis [4], as well as, the inability of midwives to handle with conditions when ergometrine is contraindicated, hence, the last recourse would be "Misopristol" as an appropriate alternative that may overcome these hindrances."Misopristol" is metabolized by the liver and less than 1% of it is excreted in the urine. The peak level is reached within 12+3 minutes in sublingual roots while maximum level of concentration reached 23 minutes later in rectal administration and up to 4 hours in vaginal route [1].

Variety of case reports and Randomized Controlled Trials (RCTs) found that 600 microgram orally is optimum for prevention and treatment of PPH. It was found to be associated with fewer side effects compared to other routes. RCTs of Misopristol usage found a 38% reduction in maternal deaths due to PPH in resource-poor communities [5]. In Sudan, home- delivery is still practiced, for, hospital- delivery hindrances such as; the wrong public-views toward hospital- delivery, poverty, illiteracy and ignorance, and difficult access to hospitals. The preventable and even treatable PPH is still one of the major leading causes of maternal morbidity and mortality. So far, it is such a big challenge for us to distribute Misopristol at community level, as well as, minimizing the deviated usage of it for illegal- pregnancy abortions.

Furthermore, both prevention and treatment depend- basically- on inject able uterotonics, which are seldom available for births outside the health system. For these reasons, the use of Misopristol to prevent or treat postpartum hemorrhage has attracted considerable attention.

“Misopristol” is an inexpensive and stable prostaglandin E1 analogue that has been shown to stimulate uterine contractility in early pregnancy and at term. Administered orally or vaginally, it is effective for inducing abortion and labor, though it poses certain risks [6]. Administration of this drug on a wide scale at community level to prevent and treat PPH is of major public health significance. Misopristol has been widely recommended to prevent PPH when other methods are not available; however, large-scale implementation projects are currently in progress. Caution has been urged, because side-effects may occasionally be life-threatening [7]. A principal reduction in PPH and other complications were obtained with Misopristol, 600 µg orally used alone (i.e., without other components of the active management of the third stage of labor - umbilical cord clamping and controlled cord traction) [8] WHO has developed guidelines supporting the use of a uterotonic when the full package of active management of the third stage of labor is not practiced, which can be either oxytocin, 10 IU administered parenterally, or Misopristol, 600 µg administered orally [9].

The drug can be safely used at community level through either administration by health providers or distribution by Community Health Workers (CHWs) (including Traditional Birth Attendants [TBAs]) directly to pregnant women for self-administration at home. Sutherland et al., noted that such an intervention is particularly cost effective [10]. Rajbhandari et al., concluded that the largest gains in protection against PPH were realized by the poor, the illiterate and those who live in remote areas [11]. Misopristol has been widely recommended to prevent PPH when other methods are not available [12], however, large-scale implementation projects are currently in progress. Caution has been urged, because side-effects may occasionally be life-threatening [10].

Methodology

Study design

This is a descriptive, prospective, cross-sectional community-based study carried out among community midwives.

Study area

Khartoum State; which is the capital of Sudan, consists of three major towns; Omdurman, Bahri and Khartoum in which their residents mostly have urban life style, while peripheries of these cities more similar to rural life style due to the huge immigration from other States of Sudan. Estimated number of community midwives in the study area is 1700.

Study population

Midwives working in their communities in Khartoum State.

Inclusion criteria

All midwives reside and work in community of the study area.

Exclusion criteria

Midwives reside in the study area, but working in clinics or hospitals.

Study period

The study data was collected during the period from 1st of Feb to 1st of July 2015.

Sample size

The sample size was calculated by using the equation:

$$N = \frac{Z\alpha pq}{e^2} \cdot \frac{(1.64)^2 (0.3)(0.7)}{(0.05)^2} = 226$$

Where: N = Sample size, Z α = Tabulated value of Z, P = Probability of the case, q = 1-p, e² = standard error.

Sampling

Cluster randomized sample.

Participants were randomly selected from the list of the midwives from each cluster. Total number of community midwives in Khartoum State was 1700: Khartoum locality: 868, Omdurman locality: 632, Bahri locality: 200. Accordingly selected numbers in the three localities was 115, 84 and 27 respectively.

Data collection

Data was collected by using a pre-designed questionnaire fulfilled by direct interview with midwives and managed by the author.

Data analysis

Data was analyzed by using the computerized program; Statistical Package for Social Sciences (SPSS), using paired T-test, then results were presented as tables and figures.

Ethical considerations

- Written consent was obtained from Sudan Medical Specialization Board (SMSB) and the Ministry of Health - Khartoum State
- Verbal consent was obtained from participants after declaring the purpose of the study
- Privacy of participants' data was considered

Results

The current study was conducted among community midwives at Khartoum State (Khartoum City, Omdurman and Bahri) and aimed to assess their knowledge and attitude towards misoprostol in Prevention of Postpartum Hemorrhage (PPH) (Table 1). The study included 226 midwives distributed to 115(50.9%) in Khartoum city, 84(37.2%) in Omdurman and 27 in Bahri. Age distribution of midwives in the study showed that, 96(42.5%) had age of 41-50 years, 74(32.7%) had age of 51-60 years, 44(19.5%) had age of 31-40 years and 12(5.3%) had age of 20-30 years. Level of education among participants has shown that, 105(46.5%) of midwives were primary school graduates, 46(20.4%) were illiterates, 45(19.9%) were secondary school graduates and 30(13.3%) were intermediate school graduates. Distribution of participants according to their experience showed that, 92(40.7%) had experience of 11-20 years, 60(26.5%) had experience of 1-10 years, 40(17.7%) had experience of 21-30 years and 34(15%) had experience of 31-40 years.

Midwives who found to receive training course were 69(30.5%), out of which 47(68.1%) had one course only, 16 (23.2%) had two courses, 5(7.2%) had 3 courses and one (1.4%) had 4 courses (Table 2). Among midwives who received training courses, 44(63.8%) had

2-5 years since the last training course, 20(29%) had 6-9 years since the last training and 5(7.2%) more than 10 years since their last training course.

Demographics	Frequency	Percent
Area		
Khartoum	115	50.9
Omdurman	84	37.2
Bahri	27	11.9
Total	226	100
Age group		
20-30	12	5.3
31-40	44	19.5
41-50	96	42.5
51-60	74	32.7
Total	226	100
Level of education		
Illiterate	46	20.4
Primary school	105	46.5
Intermediate	30	13.3
Secondary school	45	19.9
Total	226	100
Years of experience		
1-10 Years	60	26.5
11-20 Years	92	40.7
21-30 Years	40	17.7
31-40 Years	34	15
Total	226	100

Table 1: Demographics data of midwives assessed for misoprostol.

Training after graduate		Frequency	Percent
Training	Yes	69	30.5
	No	157	69.5
	Total	226	100
		Frequency	Percent
If yes	1 Course	47	68.1%
	2 courses	16	23.2%
	3 Courses	5	7.2%
	4 courses	1	1.4%
	Total	69	100%
Duration since last training		Frequency	Percent
Year	2.00 - 5.00	44	63.8%
	6.00 - 9.00	20	29%
	10.00+	5	7.2%
	Total	69	100%

Table 2: Training after graduation received by midwives assessed for misoprostol.

In regard to other uterotonic drugs used were syntocinon and ergometrine which was used by 186(82.3%), syntocinon only used by 24(10.6%) and ergometrine used by 16(7.1%) (Figure 1).

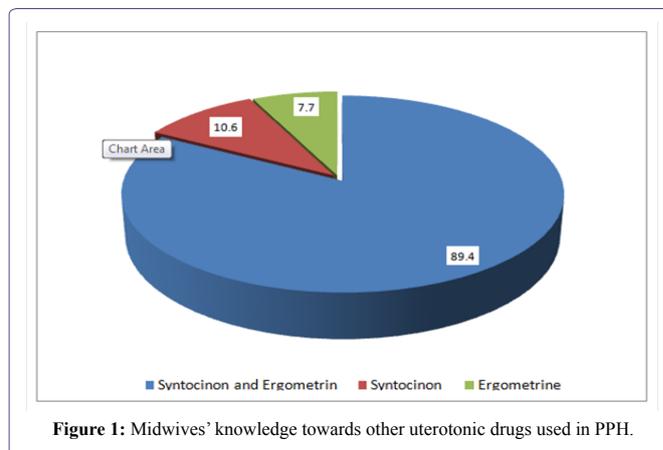


Figure 1: Midwives' knowledge towards other uterotonic drugs used in PPH.

Midwives who reported that, uterotonic drugs is always effective in PPH were 95(42%), those who said it is effective in most of the times were 87(38.5%), while 44(19.5%) denied their effectiveness (Figure 2).

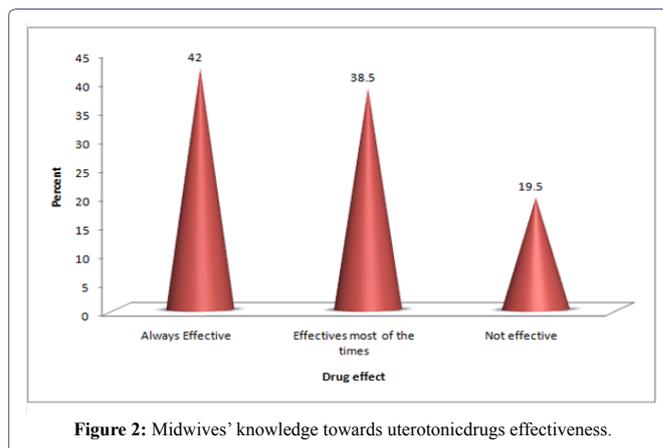


Figure 2: Midwives' knowledge towards uterotonic drugs effectiveness.

When midwives inquired about misoprostol, 181(80.1%) answered positively, 27(11.9%) said to some extent and 18(8%) didn't know it (Figure 3).

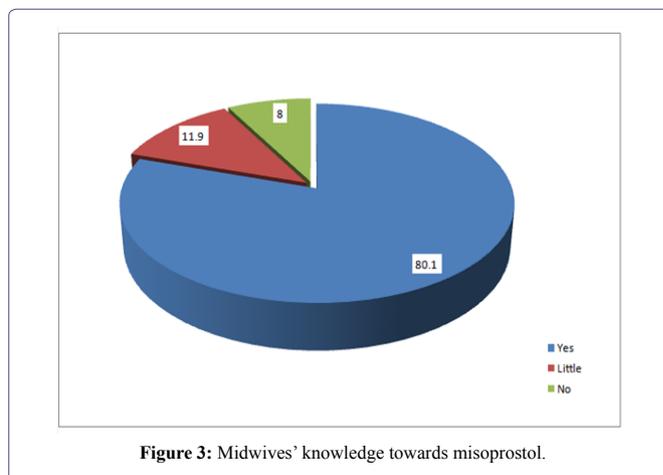


Figure 3: Midwives' knowledge towards misoprostol.

Out of 208 midwives who knew misoprostol, 107(51.4%) answered that it is used for PPH, 153(73.6%) said it is used for induction of labour and 125(60.1%) said it is used for termination of pregnancy (Table 3).

	PPH		Induction of labour		Termination of pregnancy	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Yes	107	51.4	153	73.6	125	60.1
No	101	48.6	55	26.4	83	39.9%
Total	208	100	208	100	208	100

Table 3: Midwives' knowledge about indications of using misoprostol.

Out of total, 18(8%) midwives denied their knowledge about misoprostol

Inquiring midwives about misoprostol formula showed that, 169(74.8%) said it is presented as tablets, 19(8.4%) said it is presented as pessaries, 16(7.1%) said it is presented as suppositories, one participant said it is presented as tablets and suppositories and one other midwife said it is a pessaries and suppositories (Table 4).

Misoprostol formula	Frequency	Percent
Tab	169	74.8
Injection	2	0.9
Pessaries	19	8.4
Suppositories	16	7.1
Tab and suppositions	1	0.4
Pessaries and Suppositions	1	0.4
Total	208	100

Table 4: Midwives knowledge towards misoprostol formula.

Midwives who said that, misoprostol are administered orally were 46(22.1%), who said it is administered sublingually were 138(66.3%), who said it is administered vaginally were 115(55.3%) and who said it is taken by rectal were 110(52.9%) (Table 5).

Midwives who answered correctly about dose of misoprostol tablet were 9(4.3%), while 199(95.7%) mentioned other wrong weight (Figure 4).

Midwives who found to have good knowledge about misoprostol complications were 171(82.2%), those who had little knowledge were 33(15.9%), while others; 4(1.9%) don't know its complications (Figure 5, Table 6).

Regard to midwives' knowledge about complications following misoprostol usage in pregnant ladies, 140 (67.3%) mentioned miscarriage, 129(62%) mentioned uterine rupture, 146(70.2%) mentioned fetal distress and 70(33.7%) mentioned fetal and/or maternal death (Table 7).

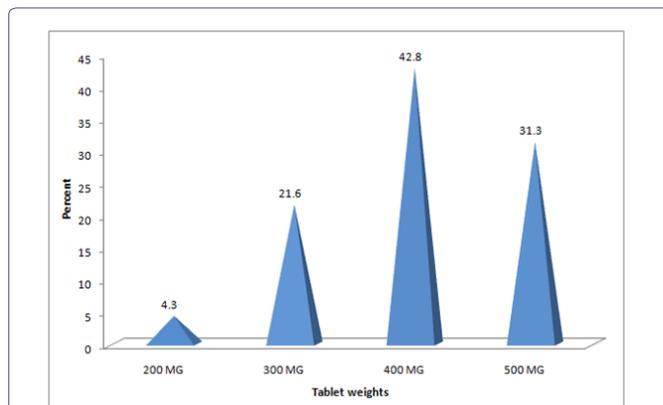


Figure 4: Midwives' knowledge towards misoprostol tablets dose.

When midwives inquired about side effects of misoprostol, 173(83.2%) mentioned sweating, 28(13.5%) mentioned diarrhea, 10(4.8%) mentioned shivering and 4(1.9%) mentioned abdominal pain, some midwives mentioned more than one side effect (Figure 6).

Discussion

One of the UN Millennium Development Goals is to reduce the Maternal Mortality (MM) by 75% by 2015. 500, 000 women die on an annual basis during pregnancy or labor. However, almost all (99%) of MMs do occur in low income countries. On the other hand, community-based providers, such as traditional birth attendants and community midwives with proper training and counseling, play an important role in reducing PPH [13]. The current study was conducted among 226 community midwives in Khartoum State, and aimed to identify their knowledge and attitude toward "Misopristol" in the prevention of PPH.

The basic data about participants showed that, most of midwives in the study were above 40 years (75.2%), and the most common midwives' ages were 41-50 years representing 96(42.5%), followed by midwives had ages of 51-60 years representing 74(32.7%). Pertaining level of education; Low education predominated among the studied group, as, 151 (66.9%) were found to have either primary education or illiterate. Low education might have a passive impact upon gaining further and updated knowledge. The general evaluation of midwives in the current study was estimated by choosing mean of correct answer among respondents; the mean of knowledge toward using "Misopristol" in the prevention of PPH; a vast majority of community midwives mentioned their knowledge about "Misopristol", but 8% denied their knowledge and other 11.9% hesitated. The dominant range of experience years in midwifery was 11-20 years, and it represented (40.7%), followed by experience of less than 10 years.

	Oral		Sublingual		Vaginal		Rectal		others
	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent	
Yes	46	22.1	138	66.3	115	55.3	110	52.9	
No	162	77.9	70	33.7	93	44.7	98	47.1	
Total	208	100	208	100	208	100	208	100	

Table 5: Midwives knowledge towards route of misoprostol administration.

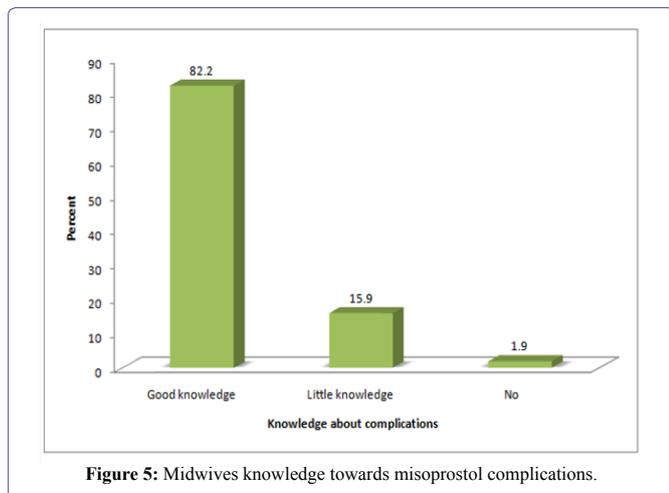


Figure 5: Midwives knowledge towards misoprostol complications.

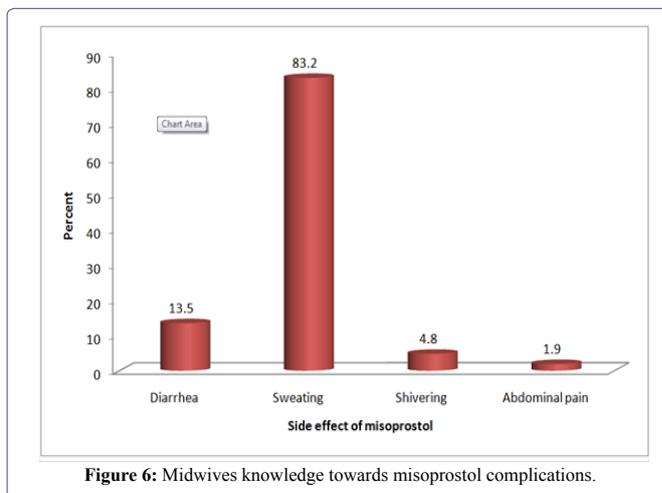


Figure 6: Midwives knowledge towards misoprostol complications.

Criteria of knowledge	% /Mean
Knowledge towards other uterotonic drugs used in PPH	89.40%
Knowledge towards uterotonic drugs effectiveness	80.50%
Knowledge towards misoprostol	92%
Indications of using misoprostol	61.70%
Misoprostol formula	74.80%
Route of misoprostol administration	49.20%
Misoprostol tablets weight	4.30%
Dose of misoprostol to prevent PPH	40.90%
Misoprostol complications	82.2
Types of complications of misoprostol	58.30%
Side effects of misoprostol	25.9
Total Mean of knowledge	59.90%

Table 6: General assessment of midwives' about different criteria of knowledge regarding misoprostol.

Moreover, the study revealed shortness in training which received by, approximately, one third of midwives (30.5%), most of them (91.3%) had either one course or two courses, with percentages of (68.1%) and (23.2%) respectively. Despite Sudan was having an early history of midwifery services, when "Miss ME Wolf" arrived to Sudan from Egypt to establish midwifery training in 1920 [14], but the current facts might indicate instability of training programs which might lack updating. When midwives were being inquired about other uterotonic drugs used in PPH, a vast majority (89.4%) mentioned both "Syntocinon", and "ergometrin". Most midwives (80.5%) whom were inquired believed that uterotonic drugs were always/most of time effective but still nearly fifth of them didn't believe in such an issue.

A majority of participants (73.6%), when we're being inquired about the indications of using Misoprostol, they were found to have better knowledge about its usage for induction of labor compared to other indications of using the drug, in terms of, termination of pregnancy and PPH, with percentages of 60.1% and 51.4% respectively; however, mean of knowledge was 61.7%. Indeed, it was quite compatible with the community-based study that was conducted by "Ranneberg LB", who reported that, induction of labor was the most common indication of use among midwives and doctors, however, treatment of incomplete and missed abortions were the most prevalent indications [5]. The right formula of "Misoprostol" was mentioned correctly by most participants (74.8%), while the rest mentioned incorrect formula.

Mean of knowledge about routes of administration of Misoprostol was 49.2%; however, a majority of participants (66.3%) knew a sublingual route of administration, followed by those who knew a vaginal route of administration (55.3%) and rectal route (52.9%), while oral route was the less to be mentioned (22.1%); however, some midwives mentioned more than one route including up to the four routes. But very few knew its weight, only 4.3% mentioned the correct weight available in Sudan.

The right preventive dose of Misoprostol was mentioned correctly by less than a half of participants (40.9%) "Which is 3 tablets equivalent to 600 microgram orally as recommended by WHO"; (In the absence of personnel to offer active management of the third stage of labor, it is recommended that the trained health worker should offer "Misoprostol" 600 micrograms orally immediately after birth (Table 8). In such cases no active intervention to deliver the placenta should be carried out) [15].

	Miscarriage		Rupture uterus		Fetal distress		Fetal and mother death	
	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent
Yes	140	67.3	129	62	146	70.2	70	33.7
No	68	32.7	79	38	62	29.8	138	66.3
Total	208	100	208	100	208	100	208	100

Table 7: Midwives knowledge towards types of complications of misoprostol.

Another important concern about use of “Misopristol” at community level was reported by Prata N et al., which is the risk associated with using Misopristol for induction of labor. The dosage required for induction of labor is only a fraction of a Misopristol tablet and a higher dose could result in serious adverse events to both mother and fetus. For this reason, published guidelines and IEC materials related to “Misopristol” for PPH prevention in home births includes the warning that “Misopristol” should never be taken before delivery of the baby. Any training related to Misopristol must strongly reiterate this warning [16]. Good knowledge about complications of “Misopristol” was found among most of midwives (82.2%), followed by other who either had little knowledge or they didn’t know (15.9% and 1.9% respectively).

Preventive dose	Frequency	Percent
1 tab	40	19.2
2 tabs	46	22.1
3 tabs	85	40.9
4 tabs	35	16.8
1 or 2 tabs	1	0.5
1,2, or 3 tabs	1	0.5
Total	208	100

Table 8: Midwives’ knowledge towards dose of misoprostol to prevent PPH.

Mean of knowledge toward types of complications of “Misopristol” was 58.3%; fetal distress and miscarriage were the most complications of “Misopristol” reported correctly by community-midwives with percentages of 70.2% and 67.3% respectively, followed by 62% who mentioned “a rupture of uterus”, and a less percentage mentioned fetal and maternal death. Regarding the drug side-effects, “Sweating” was reported correctly by a vast majority of midwives (83.2%), followed by few who mentioned diarrhea, shivering and abdominal pain. However, the study of N Mobeen et al., [11] reported that, shivering and chills were significantly more common with Misopristol [17].

Conclusion

According to the provided inquiries in the current study, the midwives’ knowledge about the diagnosis of PPH was found to be moderate, however, they showed higher mean of knowledge regarding indications of using “Misopristol”. Despite, their knowledge about side effects of “Misopristol” was found to be low, but they had a moderate level of knowledge regarding complications of “Misopristol” when it was used among pregnant ladies. Ultimately, training provided for community midwives was found unsatisfying in aspects of total coverage and frequencies of courses.

References

1. Tenore JL (2003) Methods for cervical ripening and induction of labor. *Am Fam Physician* 15: 2123-2128.
2. WHO (2013) WHO Model List of Essential Medicines. WHO, Geneva, Switzerland.

3. Høj L, Cardoso P, Nielsen BB, Hvidman L, Nielsen J, et al. (2005) Effect of sublingual misoprostol on severe postpartum haemorrhage in a primary health centre in Guinea-Bissau: Randomised double blind clinical trial. *BMJ* 331: 723.
4. Hashima-E-Nasreen, Nahar S, Al Mamun M, Afsana K, Byass P (2011) Oral misoprostol for preventing postpartum haemorrhage in home births in rural Bangladesh: how effective is it? *Glob Health Action* (Vol 4).
5. Hofmeyr GJ, Milos D, Nikodem VC, de Jager M (1998) Limb reduction anomaly after failed misoprostol abortion. *S Afr Med J* 88: 566-567.
6. WHO (2007) WHO recommendations for the management of the third stage of labor and community perceptions and actions on postpartum haemorrhage: Findings from a national survey in Ethiopia. WHO, Geneva, Switzerland.
7. Davies NM, Longstreth J, Jamali F (2001) Misoprostol therapeutics revisited. *Pharmacotherapy* 21: 60-73.
8. SC M (2006) Inadequate reporting of safety issues from clinical trials in academic journals. *BMJ*.
9. Smith JM, Gubin R, Holston MM, Fullerton J, Prata N (2013) Misoprostol for postpartum hemorrhage prevention at home birth: an integrative review of global implementation experience to date. *BMC Pregnancy and Childbirth* 13: 44.
10. Sutherland T, Meyer C, Bishai DM, Geller S, Miller S (2010) Community-based distribution of misoprostol for treatment or prevention of postpartum hemorrhage: Cost-effectiveness, mortality, and morbidity reduction analysis. *Int J Gynaecol Obstet* 108: 289-294.
11. Mobeen N, Durocher J, Zuberi N, Jahan N, Blum J, et al. (2011) Administration of misoprostol by trained traditional birth attendants to prevent postpartum haemorrhage in homebirths in Pakistan: A randomised placebo-controlled trial: a randomized placebo-controlled trial. *BJOG* 118: 353-361.
12. Sanghvi H, Ansari N, Prata NJ, Gibson H, Ehsan AT (2010) Prevention of postpartum hemorrhage at home birth in Afghanistan. *Int J Gynaecol Obstet* 108: 276-281.
13. Tang OS, Gemzell-Danielsson K, Ho PC (2007) Misoprostol: Pharmacokinetic profiles, effects on the uterus and side-effects. *Int J Gynaecol Obstet* 99: 160-167.
14. Schaff EA, DiCenzo R, Fielding SL (2005) Comparison of misoprostol plasma concentrations following buccal and sublingual administration. *Contraception* 71: 22-25.
15. Meckstroth KR, Whitaker AK, Bertisch S, Goldberg AB, Darney PD (2006) Misoprostol administered by epithelial routes: Drug absorption and uterine response. *Obstet Gynecol* 108: 582-590.
16. Bhattacharjee N, Saha SP, Ganguly RP, Patra KK, Jha T, et al. (2012) A randomized comparative study on vaginal administration of acetic acid-moistened versus dry misoprostol for mid-trimester pregnancy termination. *Arch Gynecol Obstet* 285: 311-316.
17. Pongsatha S, Tongsong T (2011) Randomized controlled study comparing misoprostol moistened with normal saline and with acetic acid for second-trimester pregnancy termination. Is it different? *J Obstet Gynaecol Res* 37: 882-886.



- Journal of Anesthesia & Clinical Care
Journal of Addiction & Addictive Disorders
Advances in Microbiology Research
Advances in Industrial Biotechnology
Journal of Agronomy & Agricultural Science
Journal of AIDS Clinical Research & STDs
Journal of Alcoholism, Drug Abuse & Substance Dependence
Journal of Allergy Disorders & Therapy
Journal of Alternative, Complementary & Integrative Medicine
Journal of Alzheimer's & Neurodegenerative Diseases
Journal of Angiology & Vascular Surgery
Journal of Animal Research & Veterinary Science
Archives of Zoological Studies
Archives of Urology
Journal of Atmospheric & Earth-Sciences
Journal of Aquaculture & Fisheries
Journal of Biotech Research & Biochemistry
Journal of Brain & Neuroscience Research
Journal of Cancer Biology & Treatment
Journal of Cardiology & Neurocardiovascular Diseases
Journal of Cell Biology & Cell Metabolism
Journal of Clinical Dermatology & Therapy
Journal of Clinical Immunology & Immunotherapy
Journal of Clinical Studies & Medical Case Reports
Journal of Community Medicine & Public Health Care
Current Trends: Medical & Biological Engineering
Journal of Cytology & Tissue Biology
Journal of Dentistry: Oral Health & Cosmesis
Journal of Diabetes & Metabolic Disorders
Journal of Dairy Research & Technology
Journal of Emergency Medicine Trauma & Surgical Care
Journal of Environmental Science: Current Research
Journal of Food Science & Nutrition
Journal of Forensic, Legal & Investigative Sciences
Journal of Gastroenterology & Hepatology Research
Journal of Gerontology & Geriatric Medicine
Journal of Genetics & Genomic Sciences
Journal of Hematology, Blood Transfusion & Disorders
Journal of Human Endocrinology
Journal of Hospice & Palliative Medical Care
Journal of Internal Medicine & Primary Healthcare
Journal of Infectious & Non Infectious Diseases
Journal of Light & Laser: Current Trends
Journal of Modern Chemical Sciences
Journal of Medicine: Study & Research
Journal of Nanotechnology: Nanomedicine & Nanobiotechnology
Journal of Neonatology & Clinical Pediatrics
Journal of Nephrology & Renal Therapy
Journal of Non Invasive Vascular Investigation
Journal of Nuclear Medicine, Radiology & Radiation Therapy
Journal of Obesity & Weight Loss
Journal of Orthopedic Research & Physiotherapy
Journal of Otolaryngology, Head & Neck Surgery
Journal of Protein Research & Bioinformatics
Journal of Pathology Clinical & Medical Research
Journal of Pharmacology, Pharmaceutics & Pharmacovigilance
Journal of Physical Medicine, Rehabilitation & Disabilities
Journal of Plant Science: Current Research
Journal of Psychiatry, Depression & Anxiety
Journal of Pulmonary Medicine & Respiratory Research
Journal of Practical & Professional Nursing
Journal of Reproductive Medicine, Gynaecology & Obstetrics
Journal of Stem Cells Research, Development & Therapy
Journal of Surgery: Current Trends & Innovations
Journal of Toxicology: Current Research
Journal of Translational Science and Research
Trends in Anatomy & Physiology
Journal of Vaccines Research & Vaccination
Journal of Virology & Antivirals

Submit Your Manuscript: <http://www.heraldopenaccess.us/Online-Submission.php>