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ResearchArticle

MISOPROSTOL: AN ALTERNATIVE TO OXYTOCIN IN MANAGEMENT OF 3rd STAGE OF LABOUR IN RURAL INDIA??

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ABSTRACT

Background: Postpartum haemorrhage is a life-threatening obstetricemergency that occurs after normal vaginal delivery or caesarean section. Prevention of PPH can be achieved by active management of the third stage of labour in most of the cases. Various uterotonic agents play major role in prevention of PPH.

Objective: To compare efficacy of oxytocin 10 IU intramuscular and misoprostol 800µg per rectally in active management of the third stage of labor and determine duration of the third stage of labor, blood loss, effect on haemoglobin of the patient, adverse effects and need for additional uterotonics in both group.

Study methods: A prospective observational study was carried out in the Department of Obstetrics and Gynaecology, Kanwatiya Hospital, SMS Medical College, Jaipur(Rajasthan) from December 2016 to February 2017. Active management of 3rd stage of labor was done by using either inj. Oxytocin 10 IU or tab. Misoprostol 800µg as per the group of the patient. Duration of the third stage of labor,the amount of blood loss, the incidenceof postpartum haemorrhage, a drop in haemoglobinconcentration from predelivery to 24 h after delivery and adverse effect of drugs were measured.

Results: Demographic characteristics were similar in each treatmentgroup. There was no significant difference between treatment groups in decrease in hemoglobin (oxytocin 0.7 g/dL, misoprostol 0.8 g/dL). Duration of 3rd stage of labor was slight more with misoprostol group.The significant side effect was shivering and fever, which were more common in the misoprostol group (shivering - misoprostol 14% vs. oxytocin 5% and (fever - misoprostol 6% vs. oxytocin 1%).

Conclusion: Rectal misoprostol 800µg is as effective as 10 IU intramuscular oxytocin in minimizing blood loss in the third stage of labour. Rectal misoprostol has a lower incidence of side effects which are self limiting. This supports the utility of misoprostol as a safe and effective uterotonic for use in the rural and remote areas of developing countries where other pharmacologic agents may be less feasible.

INTRODUCTION

Postpartum haemorrhage has been a nightmare for obstetricians since centuries. One of the commonest causes of maternal mortality in the developing world is obstetric haemorrhage, particularly postpartum hemorrhage(1-3). The incidence of fatal PPH has been reduced in the Western world, largely because of active management of the third stage, which involves controlled cord traction, uterine fundal massage, and administrationof a pharmacologic uterotonic(4).The standard pharmacologic uterotonic agent has traditionally been oxytocin or a combination of oxytocin and ergometrine maleate (Syntometrine). Use of these agents routinely during the third stage of labour has demonstrated a 40% average decrease in PPH(4). These drugs, however, must be refrigerated to remain effective. Moreover, most uterotonics must be administered by injection; which requires sterile equipment and training in safe administration, prerequisites which are unavailable for most women delivering in poor undeveloped countries.Misoprostol, a prostaglandin E1 analog can be administered orally, rectally, or sublingually.Misoprostol offers distinct advantages because it is stable at room temperature, affordable, and easy to administer. Gastrointestinal symptoms (nausea, vomiting and diarrhea) and fever are the most common adverse effects of misoprostol, which often are mild and self-limited (5-7). Several studies have shown that misoprostol is more effective than oxytocin and methylergometrine in the treatment of PPH

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(8,9). Although misoprostol can be used as first-line therapy in the treatment of PPH where oxytocin is not available (10).

In developing countries, either oxytocin is usually not available to the traditional birth attendant who performs most of the deliveries in the villages or they are not trained for storage and administration. We know that many women in developing countries never come to a hospital for labour and delivery(3). We must make the system better for these women by having available auterotonic agent like misoprostol that is easy and simple to administer, cheap to obtain, and safe to use by individuals with little or no formal medical training.

METHOD AND MATERIALS

The present study was conducted in the labour room of the Department of Obstetrics and Gynaecology, Kanwatiya hospital, SMS Medical College, Jaipur(Raj). During the period December 2016 to February 2017, 200 pregnant women undergoing spontaneous or induced labor with intended vaginal delivery were included in the study. A blood sample was obtained before delivery and 24 hours after delivery. The women were selected according to the following criteria:

Inclusion criteria

1. Low-risk singleton pregnancy
2. Gestational age ≥ 37 weeks
3. Parity ≤ 3

Exclusion criteria:

1. Women with hemoglobin <8 gm%
2. Pregnancy induced hypertension
3. Abruptioplacentae/placenta previa
4. Multiple pregnancy, grandmultipara, malpresentation, polyhydromnios
5. Previous uterine scar, chorioamnionitis, intrauterine fetal death, coagulation abnormalities.
6. History of medical disorder-Asthma/epilepsy/heart/renal disease

After delivery of the baby either oxytocin 10 IU intramuscular or tablet misoprostol 800µg per rectally inserted randomally. After delivery of the baby Cord was clamped and cut and all the fluid/liquor/blood wasimmediately removed from the delivery table and a freshspecially prepared plastic sheet replaced and blood collected in a caliberated bucket.We also collected the specially prepared 10 x 5 cmsdelivery pads soiled after delivery of the baby for visualassessment of blood-loss. As soon as signs of placental separation appeared, the placenta was delivered by controlled cord traction. Time interval between the delivery of the baby and the placenta was noted. Duration of the 3rd stage was thus calculated. Pulse rate, temperature and blood pressure were recorded 1 hour after delivery. Patient was kept in labour room under observation for a period of 1 hour. Any complaint such as nausea, vomiting, fever, headache, chills, diarrhoea and shivering was noted.

The total blood was collected in caliberated bucket from the delivery of the baby, delivery of placenta and upto one hour of delivery. In addition, the quantity ofblood loss was calculated by weighing the pads utilisedafter delivery upto one hour. To calculate this, the pads which were used were weighed before usage and after usage(after absorbance of blood). A repeathaemoglobin estimation was done after 24 hour of delivery. Finally all collected data were analyzed statistically to draw various informative conclusions.

RESULTS

A total of 200 women were enrolled and randomized to receive either rectal misoprostol 800µg(n=100) or intramuscular oxytocin 10IU(n=100) during the study period.

The majority of subjects were in the age group of 19-27 years. The mean age in Group I (oxytocin group) was 21.6 years and in Group II (misoprostol group) was 22.4 years. Majority of subjects in both groups were parity one and two, i.e., 74 % in Group I (oxytocin), 71 % in Group II (misoprostol). Maximum number of patients were inthe gestation age of 37-39 weeks. The mean gestational age in group I (oxytocin) was 38.8 weeks and in group ll (misoprostol) was 38.7 weeks.The difference between the demographic pictures of patients in both groups was not statistically significant (Table 1).

Table no. 1 Demographic characteristics of patients

Variables		OXYTOCIN 10IU IM (n=100)	MISOPROSTOL 800µg PER RECTAL (n=100)
Average Maternal age (years)		21.6	22.4
Parity	Primipara	26	29
	Multipara	74	71
Average Gestational age(weeks)		38.8	38.7
Birth weight(kg)		2.42	2.40

Table no. 2 Comparison of pre delivery and post 24 hour delivery haemoglobin level

Variables	Oxytocin 10IU IM (n=100)	Misoprostol 800µg Per Rectal (n=100)
PredeliveryHb level (gm/dl)	10.2	9.8
24 hour after delivery Hb level (gm/dl)	9.5	9.0
Decrease in haemoglobin level(gm/dl)	0.7	0.8

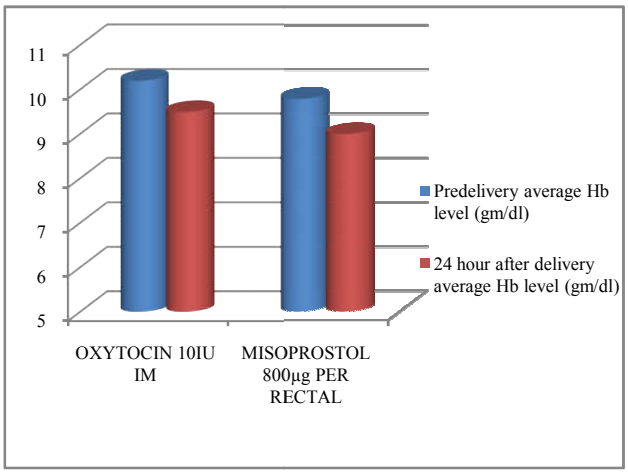

Figure 1 Comparison of pre delivery and post 24 hour delivery haemoglobin level

Table no. 3 Outcome measures to calculate efficacy of drugs

	Oxytocin 10IU IM (n=100)	Misoprostol 800µg PER Rectal (n=100)
Duration of third stage(minutes)	5.3	6.0
Average blood loss(ml)	234	238
Blood loss <500ml	95(95%)	92(92%)
Blood loss >500ml	5(5%)	8(8%)
Need of additional uterotonic	5(5%)	8(8%)
Need of blood transfusion	1(1%)	2(2%)
Third stage complication	PPH=5 Retained placenta= 0	PPH=8 Retained placenta=1

Table no. 4 Comparison of Side effects of both drugs

Side effects	Oxytocin 10IU IM (No. Of cases)	Oxytocin 10IU IM (Percentage)	Misoprostol 800µg PER RECTAL (No. Of cases)	Misoprostol 800µg PER RECTAL (Percentage)
Shievering	5	5%	14	14%
Nausea	4	4%	3	3%
Vomiting	2	2%	4	4%
Fever	1	1%	6	6%
Diarrhoea	0	-	3	3%
Headache	2	2%	0	-
Hypertension(BP>140/90)	2	2%	0	-

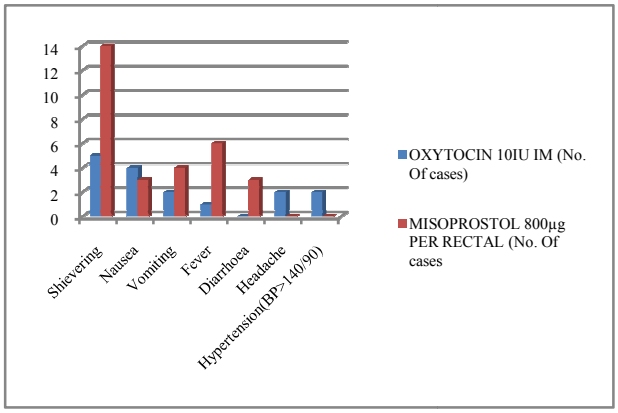

Figure 2 Comparison of Side effects of both drugs

There was no significant difference between both groups for decrease in haemoglobin concentration. The mean decrease in haemoglobin concentration was 0.8 g/dL for the misoprostol group and 0.7 g/dL for the oxytocin group (Table 2 and figure 1).

Duration of 3rd stage of labour was slight higher with misoprostol i.e. 6.0 minutes. Average blood loss, need for additional uterotonic drug and third stage complication were comparable in both group (Table 3). One woman required an operative intervention manual removal of placenta in misoprostol group and had estimated blood loss greater than 1000 mL.

The groups were similar in the incidence of nausea, vomiting, and increased blood pressure (Table 4). There were significantly more women with shivering (14% vs. 5%) and fever (6% vs. 1%) in the misoprostol group (Table 4 and figure 2).

DISCUSSION

The active management of the third stage of labour is traditionally performed with the routine use of intravenous oxytocin[11]. To substitute for oxytocin and to prevent postpartum haemorrhage misoprostol was chosen because it has similar advantages but with minimal side effects, low shelf life, cost effective and easily available. It is easy to use and does not require special storage conditions.

Our study showed that the incidence of PPH (blood loss > 500 ml) was only 8% in misoprostol group whereas it was 5% in oxytocin group. However the average blood loss, drop in haemoglobin concentration levels in both study groups were not statistically significant. This is similar to the findings in previous studies(12-19).

Parson *et al*. compared rectal misoprostol 800 µg versus oxytocin 10IU intramuscular with delivery of anterior shoulder. The results were compared in terms of change in haemoglobinconcentration before and after delivery, need of additional oxytocics, estimated blood loss, transfusion and medication side-effects. The results were comparable in both the groups(20).

In our study there was additional use of uterotonic in both group which was comparable with a study by Haque*et al*., 94% of the patients had no need for additional oxytocin and only 6% of the patients had moderate haemorrhage and additional oxytocin was added in misoprostol group. Also 2% of the patients in the oxytocin group in this study needed additional oxytocin (29).

The average duration of the third stage of labour was 6.0 minutes and 5.3 minutes for the misoprostol and oxytocin group respectively. This was also not statistically significant. The findings are comparable with those of several other studies comparing misoprostol with oxytocin (9,21-28).

The fever rate was higher in the misoprostol group in our study, but there was no significant difference between the two groups in other gastrointestinal symptoms. This finding was confirmed by Haque*et al*. (29) and Blum *et al*. (30). A randomized controlled trial was performed at two districthospitals in Ghana by Steven MP *et al*resulted shiveringwas more common in the misoprostol rectal 800mcggroup(7.5%) vs. Oxytocin (0.9%) comparable with our study i.e.(misoprostol rectal 800mcggroup 14% vs. oxytocin 5%) (32).Parson *et al*found higher rates of shivering and fever with misoprostol than oxytocin (shivering 80.7% vs. 3.6%, fever 11.4% vs. 0% respectively) (20).

Both fever and shivering with misoprostol are due to the prostaglandin E effect on central thermoregulatory centres and Lumbiganon*et al* have reported that although these symptoms may be of limited clinical concern(31). However, none of the side effects werelife threatening or serious rather most of them subsided within 6-8 hours post partum and very few patients actually required some treatment to alleviate them.

Taking into consideration that our country is a developing country and many centres do not have facilities for proper storage of oxytocin. As for its efficacy, oxytocin needs to be stored at a temperature of 2-8 degree Celcius, but many of our centres do not have refrigeration and poor electricity supply facilities. Hence misoprostol seems to be a better option for our low resource settings. Misoprostol is cheaper compared to oxytocin and its administration is much easier and no special training is needed to administer it. Again it does not require intramuscular administration like oxytocin and also the results are comparable to those of oxytocin use with an acceptable safety profile.

CONCLUSION

We concluded that misoprostol is as effective as oxytocin in the active management of third stage of labour. Rectal misoprostol are well tolerated, practical advantage of ease of administration in the patients who are vomiting or unable to take orally or are under anaesthesia and the usual side effects of shivering and fever were noted only infrequently and self limiting.

Hence if misoprostol is made available to the trained birth attendants, who supervise majority of the births and who do nothave skill to administer injectables at delivery and do not have a suitable heat stable drug in absence of cold chain facilities in rural India, the lives of many women dying of atonic PPH can besaved.

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