

Misoprostol Versus Oxytocin in the Active Management of the Third Stage of Labour

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Summary:

Objective : A randomised controlled trial was performed in Sir Solimullah Medical College Mitford Hospital, a tertiary hospital in Dhaka City for one year to compare oral misoprostol with intramuscular oxytocin in the prevention of post partum haemorrhage (PPH). **Method:** A total of 400 women were randomised to received either 400mg misoprostol orally or 10 I.U oxytocin intramuscularly. The incidence of post partum haemorrhage and side effects were examined. **Result:** The demographic and labour characteristic were comparable. PPH occurred in 3.80% of women given misoprostol and in 2.63% of those given

oxytocin ($P>0.50$). Measured blood loss of more than 1000 ml occurred 2.38% of the misoprostol group compared with 1.58% in the oxytocin group ($P>0.50$). There was no significant difference in the need for additional oxytocin drugs or blood transfusion in women of both groups. Significant side effect of misoprostol were shivering ($P<0.01$). **Conclusion :** Oral misoprostol is as effective as intramuscular oxytocin in the prevention of PPH. Shivering and transient pyrexia were special side effects of misoprostol. Misoprostol has potential in reducing the high incidence of PPH in developing countries.

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Introduction :

Post partum haemorrhage (PPH) is a serious obstetrics problem and primary PPH is said to occur in about 5-8% of deliveries.¹ Maternal mortality in Bangladesh is about 3 per 1000 live birth.² Among the other causes haemorrhage ranging 20-25% of cause of maternal mortality and 12% due to antepartum haemorrhage and post partum haemorrhage. PPH is one of the leading cause of maternal mortality in developing country.^{3,4} The common cause of PPH is uterine atony (80%).¹ The underlying principle in active management is to excite powerful uterine contraction following birth of the head or anterior shoulder of the baby, which minimise the blood loss in third stage approximately to $\frac{1}{3}$ th.³ Prostaglandin are hormone naturally present in the uterus that causes contraction during labour.⁵ Misoprostol is a synthetic 15-doxy 16 hydroxy-16 methyl analogue of naturally occurring prostaglandin E_1 (PGE_1). Because of its prostaglandin activity it is

also very useful for cervical ripening and induction of labour.^{6,7} It is also used in 1st and 2nd trimester abortion and has been shown in several randomised placebo controlled trial to significantly reduce risk of PPH and also control of PPH.⁶ It is stable at room temperature, low cost, easily administrable, available in tablet form and definitely advantageous than the other PGs with few systemic side effect. Its absorption is rapid and effect on the post partum uterus has been shown to be rapid.⁸

Our aim was to show the effectivity of oral misoprostol versus oxytocin for the active management of third stage of labour to reduce the risk of PPH.

Materials and Methods :

This is a prospective longitudinal study was conducted in the Gynae department of Sir Solimullah Medical College Mitford Hospital during the period of January 2003 to December 2003. A total of 400 (Four) hundred parturient women were randomised to received either 400 microgram (μg) of misoprostol orally or 10 I.U oxytocin intramuscularly just after cord clamping labouring women either nulliparous or multiparous with no known risk for excessive third stage blood loss, vertex presentation, no previous caesarean section delivery, induced, augmented or spontaneous labour were included. Among the 400 patients, 210 patients were selected for misoprostol and 190 were selected for intramuscular oxytocin.

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Outcome measures were incidence of post partum haemorrhage, estimation of average blood loss, the length of the third stage of labour, the percentage of women requiring manual removal of Placenta, further oxytocin and blood transfusion and the side effect of both the groups. Blood loss was estimated on approximate basis by the delivering physician after collecting blood within a plastic bowl.

Statistical analysis was performed using SPSS Programme. Data were analysed by chi-square test (χ^2) to compare frequency distribution. A difference was considered statistically significant at p value 0.05 level.

Results:

Among the 400 patients, 210 were assigned to receive misoprostol and 190 received oxytocin randomly. At randomization the two group were well balanced and comparable for demographic and labour characteristics.

In misoprostol group significant number of patient developed shivering, which was statistically significant than the oxytocin group. Other parameters of both groups showed no significant difference.

The result of both groups are shown in the following tables. n=total number of patient. no=number.

Table-I

<i>Post partum haemorrhage due to uterine atonicity.</i>					
Misoprostol(n=210)		Oxytocin (n=190)		P value	Significance
No. of patient	Percentage	No. of patient	Percentage		
8	3.80	5	2.63	P>0.50	Not Significant (NS)

$\chi^2=0.4409$ df. 1, P>0.50

In table 1, 8 patient in misoprostol group and 5 patient in oxytocin group develop PPH, which is not significant statistically.

Table-II

<i>Estimated Blood loss</i>			
Character	misoprostol (n=210)	Oxytocin (n=190)	Significance
Average blood loss in each patient	325.4 ml	375 ml	NS

Table II shows average blood loss in each patient in both group 325.4 ml and 375 respectively which is not significant statistically.

Table-III

<i>Measured blood loss > 1000 ml occurred</i>					
Misoprostol(n=210)		Oxytocin (n=190)		P value	Significance
No. of patient	Percentage	No. of patient	Percentage		
5	2.38	3	1.58	P>0.50	Not Significant (NS)

$\chi^2=0.328$, P>0.50

In this table; more than 1000 ml blood was lost in 5 & 3 patients in misoprostol & oxytocin group respectively which is not significant.

Table-IV

<i>Additional Oxytocin drugs require before and after separation of placenta.</i>					
Misoprostol(n=210)		Oxytocin (n=190)		P value	Significance
No. of patient	Percentage	No. of patient	Percentage		
5	2.38	6	2.83	P>0.50	(NS)

$\chi^2=0.1978$, P>0.50

Additional oxytocin required for further uterine contraction in 5 and 6 patients respectively in two group which is not significant statistically.

Table-V

<i>Length of third stage of labour</i>		
Misoprostol (Time)	Oxytocin (Time)	Significance
4 min 49 sec.	5 min	NS

Time required for the separation of placenta in each patient of both group is not statistically significant.

Table-VI

<i>Patient required manual removal of placenta</i>					
Misoprostol(n=210)		Oxytocin (n=190)		P value	Significance
No. of patient	Percentage	No. of patient	Percentage		
2	0.95	1	0.05	P>0.50	(NS)

$\chi^2= 0.2456$, df 1, P>0.50

Manual removal of placenta require only 2 patients in misoprostol & 1 in oxytocin group respectively which is statistically not significant.

Table-VII

<i>Pain during third stage of Labour</i>					
Misoprostol (n=210)		Oxytocin (n=190)		P value	Significance
No. of patient	%	No. of patient	%		
5	2.38	4	2.10	P>0.50	NS

$\chi^2= 0.1978$, P>0.50

Here only 5 and 4 patients developed pain respectively in both group which is also not statistically significant.

Table-VIII

<i>Side effect of both groups</i>						
Character	Misoprostol (n=210)		Oxytocin (n=190)		P value	Significance
	No. of patient	%	No. of patient	%		
Shivering	13	6.19	2	1.05	P<0.01	Significant
Diarrhoea & fever	4	1.90	2	1.05	P<0.50	NS

$\chi^2= 7.296$, df 1, P<0.01 (Significant)

$\chi^2= 7.488$, df 1, P<0.50 (not significant)

This table shows, 13 patients in misoprostol group 2 patient in oxytocin group developed shivering after use of drugs. This is statistically significant. Diarrhoea & fever develop about 4 & 2 patient respectively in both group which is not statistically significant

Discussion

Misoprostol, is a synthetic PGE₁ analogue. Its FDA approved indication is for the prevention of stomach ulcer in patient taking non steroidal anti-inflammatory drugs. Because of its prostaglandin activity it is also used for reducing the risk of PPH and also to control of PPH.^{6,7} It is available in tablet form and can be given orally and rectally for the active management of third stage of labour. In this study, we gave 400 microgram (µgm) of misoprostol orally in one group (n=210) and intramuscular oxytocin 10 I.U. in another group (n=190). The incidence of PPH in misoprostol group and oxytocin group were 3.80% versus (vs) 2.63% which is comparable to another study e.g. 1% vs 0% respectively done by Oboro VO, Tobowei TO.⁹ The estimated average blood loss in each patient of this study was 325.4 ml in misoprostol group and 375 ml in Oxytocin group respectively which coincide with 345 ml vs 417 ml in another study done by Surbek DV et al.¹⁰ The length of third stage labour in each patient in present study was 4 minute 49 sec in misoprostol group and 5 minute in oxytocin group which is less than another study e.g 8 minute vs 9 minute but similar regarding statistical significance because both studies shows no significant difference between two group.¹⁰ Blood loss more than 1000ml in present study was 2.38% vs 1.58% which is comparable to another study e.g. 3.7% vs 2% done by kundodyiwa Tw et al.¹¹ The additional oxytocin before or after placental separation was used less often in both groups such as 2.38% vs 2.63% which is comparable to another study 16% vs 38% e.g. both study shows no statistically significant difference.¹⁰ Regarding blood transfusion, it was 1.90% vs. 1.58% respectively in this study which is comparable to study done by kundodyiwa Tw et al.¹¹ The manual removal of placenta required 0.95% vs 0.53% respectively in this study which is also similar to one study.¹⁰ There were no significant difference in pain during third stage of labour, post partum fever or diarrhoea but shivering was more in the misoprostol group which was observed in present study and all other studies which is statistically more significant than the oxytocin group.^{9,10,11} From above discussion it has been observed that in all the parameter except shivering there were no significant difference between the misoprostol group and oxytocin group.

Conclusion :

Oral misoprostol is as effective as intramuscular oxytocin in the prevention of PPH. So, oral misoprostol can replace intramuscular oxytocin in the active management of third stage of labour in low risk women in developing countries especially as it is administered orally and it is thermostable in tropical conditions. Shivering and transient pyrexia were specific side effects of misoprostol which has potential in reducing the high incidence of PPH in developing countries.

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