

Maternal and neonatal outcome following induction with misoprostol versus oxytocin in primigravidae at term

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ABSTRACT

Introduction: The purpose of this study was to compare the outcome of vaginally administered misoprostol versus intravenously infused oxytocin for labor induction in term primigravidas.

Method: A total of 106 term primigravidas with indication for induction were assessed for eligibility to enter the study. Those meeting the inclusion criteria were assigned to two groups, women induced in TUTH as misoprostol group and WRH as oxytocin group. The misoprostol group received 50 µgm every 6 hours upto 2 doses. The oxytocin group received an infusion of 5 units which was gradually increased upto 60 drops/min maximum of 3 pints. The outcome of labour was compared in the two groups.

Result: Fifty-three women received oxytocin, and 53 women received misoprostol. Maternal demographics, pre induction Bishop scores, were similar between both the groups. Mean induction to delivery interval were similar in both groups (10.04 vs 10.64 , P value = 0.68). Caesarean delivery rate was higher in oxytocin (34%) compared with misoprostol (13%). There was no difference in maternal complications or neonatal outcome between the two groups.

Conclusion Misoprostol is a safe and effective drug for the induction of labour in term primigravidas. Failure is seen less with misoprostol and caesarean sections are less frequently indicated as compared to oxytocin.

Keywords: Induction, labour, misoprostol, oxytocin

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INTRODUCTION

WHO has defined induction of labour as the process of artificially stimulating the uterus to start labour. Unpublished data from the WHO Global Survey on Maternal and Perinatal Health, which included 373 health-care facilities in 24 countries and nearly 300 000 deliveries, showed that 9.6% of the deliveries involved labour induction.¹

Both oxytocin and misoprostol are used for induction labor in Nepal. A number of trials have shown that misoprostol is more effective than oxytocin for labor induction in terms of reducing caesarean section rate, post-partum hemorrhage and time of induction.²

During recent years it necessitates a careful review of indications, resulted risks, and benefits of labor induction with the use of oxytocin and misoprostol (a synthetic prostaglandin E1).³

Oxytocin alone still remains the major drug for induction in many developing nations like ours even in primigravidas with unfavorable cervix. Misoprostol has shown to be a promising agent, compared to oxytocin and other prostaglandins.⁴ The aim of the present study is, therefore, to evaluate maternal and neonatal outcome of vaginally administered misoprostol in comparison to that of intravenously infused oxytocin for labor induction in term pregnant women.

METHOD

A prospective study with a total sample of 106 (53 in each group) for 6 months (16th December 2012 – 16th May 2013) was conducted in the Department of Gynecology and Obstetrics, maternity ward Tribhuvan University Teaching Hospital, Kathmandu and Western Regional Hospital, Pokhara, Nepal. Tablet misoprostol 50 µg administered per vaginally 6 hourly till bishop's score > 6 and /or maximum upto 2 doses. In premature rupture of membrane (PROM) misoprostol 50 µg was inserted 4 hourly upto 6 doses. 5 units of oxytocin in 500ml of 5% dextrose in titrating dose starting from 10 drops/min and increasing 10 drops/min half hourly upto 60 drops/min for maximum of 3 pints (15 units/1500ml).

Fetal heart sound for 1 minute and uterine contraction for 10 minutes was recorded before and after drug administration and then half hourly. Per vaginal examination was performed 4 hourly to assess the cervical dilatation or progress of labour. If bishop's score increased > 6 or women went into active labour, next dose of misoprostol was withheld in misoprostol group whereas oxytocin infusion continued at the same rate at which adequate contraction was achieved till delivery. Data are statistically described in terms of frequencies and percentages. For comparing categorical data, chi square

test was used. Probability value (p- value) less than 0.05 is considered statistically significant. All statistical calculations were performed using Microsoft Excel version 7 and SPSS 13 statistical program.

RESULT

Table 1: Pre induction characteristics

Variables	Oxytocin (n=53)	Misoprostol (n=53)	P-value
Mean age(Years)	23.75 ± 3.45	24.4 ± 2.98	0.30
ANC visits			
2-4	30%	26%	0.58
>4	70%	74%	
Mean gestational age (Weeks)	40.6 ± 0.96	40.2 ± 0.94	0.72
Mean Bishop's score	4.19 ± 0.59	3.64 ± 0.59	0.000

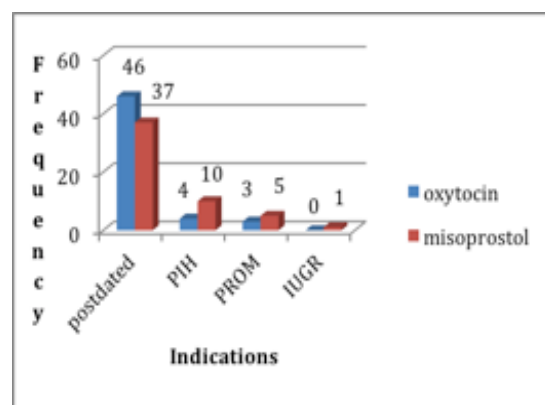


Figure 1: Indications for induction

Table 2: Post induction outcomes

Variable	Oxytocin (n=53)	Misoprostol (n=53)	P value
Mean induction to delivery interval (hours)	10.04 ± 1.77	10.64 ± 1.87	0.68
Meconium stained liquor	13%	14%	0.40

Only 17 out of 46 (37%) induced with misoprostol required oxytocin augmentation among which 2 required 5 units and 15 required 10 units of oxytocin.

Table 3: Mode of delivery

Mode	Oxytocin	Misoprostol	P value
Vaginal	64%	85%	0.04
Instrumental (Vacuum)	2%	2%	
LSCS	34%	13%	

Regarding the maternal complications there were total of 7 cases of postpartum haemorrhage which was caused by cervical tear in a woman in oxytocin group followed by uterine atony. P value was 0.43 that was not statistically significant.

Table 4: Neonatal outcomes

Neonatal Outcome	Oxytocin
Mean birth weight (KG)	3.03 ± 0.42
Mean Apgar score 1 min	6.79
NICU admission	2%

Mean birth weight of babies in oxytocin group was 3.03 ± 0.42 kg and in misoprostol group was 3.05.

DISCUSSION

Mean age in majority of women were between the ages of 20-24 years in both the groups. Study done by Loto et al. in Nigeria showed mean age of 30.22 ± 5.63.⁵ This reflects cultural prevalence of early marriage and child birth in our society. In more recent years (since 2006), trend towards shorter gestational ages has partially reversed (down 12%) and births at 39 weeks or more have increased (up 9%).⁶

Prospective observational study by Regmi et al at BPKIHS showed postdated pregnancy and hypertensive disorders to be the common indications.⁷ 78% of women in misoprostol group responded to 2 doses of misoprostol whereas study done by Sanchez et al showed 74% of responded to single dose.⁸ This might be due to lower mean pre-induction Bishop's score (3.64 ± 0.59) than the other study (4±2.2). Augmentation with oxytocin in this study was found to be higher compared to study done in Turkey.⁹ This variation in result might be due to lower required mean dose of misoprostol compared to other study. Mean dose for oxytocin was 9.09 ± 5.3 while it was 16 ± 1 in study done by Ferguson et al. The requirement of higher dose can be explained by the higher preinduction Bishop's score in oxytocin group of 4.19 ± 0.59 than the other study 2.35 ± 0.2.¹⁰

Meconium stained liquor was observed in 7(13%) women induced with oxytocin and 8 (15%) with misoprostol which was statistically not significant. Similar observations have been made by Ferguson et al with meconium stained liquor in 5 (10%) patients in oxytocin and 3 (6%) in misoprostol group.¹¹ Some studies have stated that uterine hyper stimulation lead to more meconium staining with misoprostol.¹²

More women in oxytocin group i.e. 18 (34%) underwent LSCS than in misoprostol group (7, 13%). The result was shown to be statistically significant with p value of 0.04. Inclusion of nullipara with Bishop's score of <6 is probably responsible for higher LSCS rate in the misoprostol group. The finding is consistent with study by Kidanto H L et al in which vaginal delivery in the misoprostol group was 90% as compared to 68% in the oxytocin group with p value of <0.001.¹³ In another study conducted by Elhassan E M et. al in Sudan the rate of vaginal delivery was found to be significantly high in misoprostol group, and caesarean section rate was significantly low in misoprostol group.¹⁴

However, no significant differences were noted in mode of delivery in a similar study by Fonseca et al. This finding is probably due to inclusion of approximately 60% of multigravidae in the study by Fonseca et al.¹⁵

One NICU admission from oxytocin group for grunting and two for misoprostol group for presumed sepsis during the study might probably be due to premature rupture of membrane. The findings were not statistically significant. The outcomes considered in current study shows that there is no significant difference in neonatal outcome in between the groups and this has been observed in several other studies also conducted by Aquino MM et al, Ferguson Li et al and Pervin MS et. Al.^{3,16,17}

Sample size is small and non-probability purposive sample, also convenience and homogeneity of the sample limits the generalizability of this study. The other limitations of this study are inability to design a double blind clinical trial due to different routes of drug administration and a short post-delivery follow-up period.

CONCLUSION

The use of misoprostol is relevant in our environment where there is lack of facilities of oxytocin storage. The rate of caesarean section is less frequent with misoprostol induction than oxytocin. There were no major maternal complications observed in both the groups. Neonatal outcomes was similar in both the groups. Thus it can be concluded that intravaginal misoprostol is very effective for induction of labour with unfavorable cervix than intravenous oxytocin in primigravida.

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