Original Research Article

A comparative study of rectal misoprostol versus intravenous oxytocin in reducing intra and postoperative bleeding during elective cesarean section

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Abstract

Background: To Compare the efficacy and safety of 400mcg misoprostol per rectum preoperatively versus intravenous oxytocin in reducing intra operative and post operative bleeding in elective caesarean section. **Methods:** The following study was include 300 women and take place in Department of obstetrics and gynaecology, B.L.D.E, Bijapur who were elective cases for cesarean section. During the period of 1st Dec2017– 30th June 2019. The study will include two groups. Group (A) MISOPROSTOL Group-150: womens taken up for cesarean section were given preoperatively tablet misoprostol 400 microgram per rectum after spinal anesthesia before painting and draping was done. Group (B) – OXYTOCIN Group -150: womens were given inj. oxytocin 10 IU intramuscularly after the baby was extracted out in cesarean section. **Results:** The age range varied from ≤20 years to >25 years. Most common age group was 21-25 years constituted total 185 (61.7%) patients. The mean age of Misoprostol and Oxytocin group was 22.88 and 22.92 years respectively. In the present study we observed the number of multiparous women were higher than primiparous women. Multiparous and primiparous women were 54.7% and 45.3% respectively in Misoprostol group; 64% and 36% in Oxytocin group. **Conclusion:** The above results indicate that in the context of active management of 3rd grade labour, Misoprostol has comparable effectiveness to oxytocin (10 IU IV) in the prevention of early postpartum haemorrhage However, misoprostol was associated with higher incidence of shivering and pyrexia but no other serious adverse effects occurred.
Key words: Postpartum hemorrhage; Misoprostol; oxytocin

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INTRODUCTION

Deliveries by caesarean section (CS) is one of the most generally performed obstetric activities everywhere throughout the world[1]. By and by it opens ladies to the danger of abdominal procedure, damage to the pelvic structures, may leads to requirement for blood transfusion[1] .During end of pregnancy blood supply of uterus is 500-750 ml/min.[2] Due to huge blood supply there is blood loss of approximately 1000ml during CS[3].Many factors would be implicated to affect intra-operative blood loss during CS e.g. maternal causes; weight, parity, previous CS, fetal causes; multiple gestation, polyhydramnious, malpresentation, technical causes; operative time, type of incision, placental separation technique, placental position and the type of anesthesia. Consequently, judicious estimation of operative blood loss during CS is very much significant for abating peri-operative morbidity and mortality and refraining need and risks of unwaranted blood transfusion[4]. Intra-operative estimation of blood loss for CS is both poorly reproducible and typically an under-estimate[5].Therefore comparison of surgical blood loss is a challenging exercise and it varies from one institution to

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another. There are diverse projects that had been endeavour to evaluate intra-operative blood loss[6] Most conventional practice of assessing blood loss by operative staff is through perception in spite of being claimed to be notorious by some investigators.[7] Not only anaesthesiologist but also obstetricians following visual estimation of blood loss [8]. PPH is sorted as essential on the off chance that it happens inside 24 hours of conveyance and auxiliary if inordinate blood loss happens at 24 hours or progressively after the conveyance. Indeed most cases are essential PPH and the time from starting to death is shorter than other major obstetric entanglements. Death from PPH has been seen because of two important factors. The first one is due to low level of haemoglobin that affects the survival rate of women from PPH.[9] according to World Health Organization (WHO) " anemia in pregnancy as Hb level <11 g/dl anemia in developing countries" has been noted more than 50%.[10]Risk of low Hb and PPH has a very good correlation and need of emergency hysterectomy as well .[11] Anemia can be recognized during pregnancy however early recognition and management are not continually encouraging in spots where constrained access to quality antenatal consideration and is additionally included by dietary lacks and simultaneous comorbidities influencing iron assimilation .[12] The second factor that has been viewed as contributing factors to death rates from PPH has more switches for impact, as it identifies with access to an emergency clinic with accessible offices for the administration of Post partum haemmorhage , including blood donation centres and prepared staffs to analyze and treat PPH. In the mean time the administration of PPH may additionally confounded by deferred diagnosis .[9]

Methodology:

Type of Study: It was prospective comparative study.

Place of Study: BLDE UNIVERSITY'S in Dept. of OBG.Shri B. M. Patil Medical College Hospital and Research Centre, Vijayapur.

Period of Study: 1st Dec2017– 30th June 2019.

Sample Size: As per study done by Minoo Rajei *et al*[5] With Anticipated Mean Difference of postoperative blood loss between the two studyGroups as 28.1 and Anticipated SD as 54.6,the minimum sample size is 300 with 90%power and 5% level of significance.

Following formula is used to estimate the sample size for proposed project.

$$n = \frac{(Z_{\alpha}+Z_{\beta})^2 \times 2\times\sigma^2}{MD2}$$

Here, Z=Z statistic at a level of significance

MD=Anticipated mean difference

SD= Anticipated standard deviation.

After calculation, total **300** women of high risk pregnancy were included undergoing caesarean section in whom Post-Partum Hemorrhage (PPH) was anticipated. Women were counselled about their participation in the study. Written informed consent was obtained before cesarean section.

STATISTICAL ANALYSIS

All characteristics was summarized descriptively. For continuous variables, the summary statistics of N, mean, standard deviation (SD) were used. For categorical data, the number and percentage were used in the data summaries and data was analyzed by Chi square test for association, comparison of means using t test, ANOVA and diagrammatic presentation.

Inclusion criteria:

- Singleton term pregnancy (37 -40) wks undergoing elective LSC.

Exclusion criteria:

- Previous rupture uterus
- Coagulopathy
- Fetal Distress
- Presence of Comorbid diseases like Cardiac, Respiratory, Renal or Hepatic disease.

METHODOLOGY

The following study was include 300 women and take place in DEPPARTMENT OF OBSTETRICS AND GYNAECOLOGY, BLDE,BIJAPUR who were elective cases for cesarean section. Detailed history of all the patients were taken according to the performa and complete examination and all necessary investigations was done. After having m*et al*l the inclusion and exclusion criteria and obtaining written consent.

The study will include two groups.

Group (A) MISOPROSTOL Group-150:

In group A, preoperatively tablet misoprostol 400 microgram per rectum was kept after spinal anesthesia before painting and draping was done in women who under went elective LSCS .

Group (B) –OXYTOCIN Group -150

In group B, women were given intravenous oxytocin 10 IU in 500ml RL after the baby was extracted in cesarean section.

Hemoglobin level was measured before and after 24 hours of the operation. Side effects like shivering, nausea and vomiting along the operation and up to 2 hours after the operation was recorded. Temperature was monitored routinely and noted in the data sheet when greater than 37.5°C.

The amount of blood loss during cesarean section and 2 hours postoperatively was assessed. Total blood loss during cesarean delivery was measured by adding the volume of the suction bottle with the blood soaked sponges (know dry weight). Blood loss 2 hours after cesarean delivery was also measured by using blood collection

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drape. The whole blood loss was estimated by adding the blood in the suction bottle, bloodsoaked sponges and blood collection drapes.

Haematocrit values were noted before and 24 hours following surgery. Vital signs were observed continuously intraoperative and every 30 minutes after that.

Study outcomes:

The primary outcome of this study was estimation of blood loss during and after CS following administration of rectal misoprostol or intravenous oxytocin.

The secondary outcome measures included the need for any additional oxytocic drugs or changes in hematocrit value after deliver and incidence of side effects.

RESULTS

After selection of study population data were collected and analyzed. Total 300 patients were selected where 150 of them received misoprostol and another /150 received oxytocin. Data is tabulated in the following section. The above table shows the age distribution of the study participants of both groups. In Misoprostol group of the present study ≤20 years, 21-25 years and >25 years constituted 19.3%, 64.7% and 16% patients respectively. In Oxytocin group ≤20 years, 21-25 years and >25 years constituted 25.3%, 58.7% and 16% patients respectively.

TABLE:1. Mean age between study groups

Paramaters	Misoprostol		Oxytocin		p value
	Mean	SD	Mean	SD	
Age (yrs)	22.88	2.62	22.92	2.89	0.900

The above table shows the mean age of misoprostol and Oxytocin Group was 22.88 and 22.92 years respectively. Above analysis for mean age of both groups we found no significant difference as the p value was 0.900.

TABLE:2. Distribution of parity between study groups

Parity	Misoprostol		Oxytocin		p value
	N	%	N	%	
Multi	82	54.7%	96	64.0%	
Primi	68	45.3%	54	36.0%	0.100
Total	**150**	**100.0%**	**150**	**100.0%**	

Parity distribution of study participants is mentioned in the above table. Multiparous and primiparous women were 54.7% and 45.3% respectively in Misoprostol group; 64% and 36% in Oxytocin group.

TABLE:3. Distribution of side effects between study groups

Side Effects	Misoprostol		Oxytocin		p value
	N	%	N	%	
Fever	9	6.0%	0	0.0%	<0.001*
Nausea	0	0.0%	8	5.3%	
Shivering	33	22.0%	0	0.0%	
Vomiting	0	0.0%	8	5.3%	

Note: * significant at 5% level of significance (p<0.05)

The above table shows the side effects of the drugs among the study subjects. In Misoprostol group the most common side effect was shivering accounts for 22% (33) patients followed by fever accounts for 6% (9) patients. In Oxytocin group nausea and vomiting were the commonest side effect account for 5.3% (8) patients each. While analyzing we found statistically insignificant difference for side effects in both groups as the p value was <0.001.

TABLE:4. Mean blood loss between study Groups

Paramaters	Misoprostol		Oxytocin		p value
	Mean	SD	Mean	SD	
Blood loss (ml)	185.13	49.68	180.07	52.51	0.391

Mean blood loss level for Misoprostol and Oxytocin group was 185.13 and 180.07 ml respectively. The difference in blood loss was statistically insignificant between the two groups as the p value was 0.391. Data is tabulated in the above table.

TABLE: 5. Hb Parameters between Study Groups

Paramaters	Misoprostol		Oxytocin		p value
	Mean	SD	Mean	SD	
Before Delivery Hb	9.91	0.87	9.81	0.81	0.307
After delivery Hb (24Hrs)	9.28	0.85	9.32	0.77	0.633
Fall in Hb (gm/dl)	0.58	0.17	0.59	0.26	0.549

The above table shows the mean Hb status of both groups before and after delivery (24hrs) and the mean fall of Hb level. The mean Hb level of misoprostol group before and after 24 hrs of delivery was 9.91 and 9.28 respectively. In Oxytocin group the mean Hb level before and after 24 hrs of delivery was 9.81 and 9.32 respectively. The mean fall of Hb level for Misoprostol and Oxytocin group was 0.58 and 0.59 mg/dl respectively. The difference in mean Hb level before and after 24 hrs of delivery and fall in Hb level was insignificant as the p value was >0.05.

TABLE:6. Mean Diastolic Blood Pressure Between Study Groups

DBP (mmHg)	Misoprostol		Oxytocin		p value
	Mean	SD	Mean	SD	
Before Delivery	77.89	5.72	78.35	5.42	0.481
After Delivery	77.37	5.31	82.29	5.97	<0.001*

Note: * significant at 5% level of significance (p<0.05)

The mean DBP of Misoprostol group before and after delivery was 77.89 and 77.37 mm of Hg respectively. In Oxytocin group the mean DBP before and after delivery was 78.35 and 82.29 respectively. Above analysis we found statistically significant difference for mean DBP only after delivery in both groups as the p value was <0.001. The difference in mean DBP before delivery in both groups was statistically insignificant as the p value was 0.481.

DISCUSSION

The present study was a prospective comparative type study where we assessed the safety and efficacy of preoperative per rectal 400mcg Misoprostol versus 10U intravenous Oxytocin in 500ml RL used for elective cesarean section to reduce intra and post operative bleeding under the following headings: According to age distribution in this study, we found that almost two thirds of patients were in their third decade. Mean age of Misoprostol and Oxytocin group was 22.88 and 22.92 years respectively. This is consistent with the fact that during this age group, ladies are in their highest fertility and sexual activity[13]. Nialm S *et al*[14] in a similar study also found the mean age of Misoprostol and Oxytocin group was 23.3 ±3.57 and 24.28 ±4.49 respectively which is quite consistent with our study. Similar findings were observed in a study by Rahim AYHA *et al*[15] where 67.1% patients were in their third decade of life. In the present study multiparous and primiparous women were 54.7% and 45.3% respectively in Misoprostol group; 64% and 36% in Oxytocin group. Rahim AYHA *et al*[6] also found similar observation where primiparous and multiparous women were 28.6% and 71.4% respectively in their study. Diallo M *et al*[16] in a similar study found the man parity of Misoprostol and Oxytocin group was 2.49 and 2.51 respectively which is in an agreement with the present study. The commonest side effect of Misoprostol in the study subjects was shivering accounts for 22%(33) patients followed by fever constituted for 6%(9) patients. In Oxytocin group nausea and vomiting was observed as side effects constituted 8% patients each. While analyzing for side effects we found a highly significant difference in two groups. Shivering was significantly higher with per rectal Misoprostol which was similar with study done by Kundodyiwa, and Chaudhuri *et al*[17]. Diallo M *et al*[16] in their study found the occurrence of side effects was mostly observed in the misoprostol group: 13.64% against 3.4% in the oxytocin group ($p = 0.004$). Shivering occurred significantly more ($p = 0.001$) in patients who received misoprostol compared to those who received oxytocin. 7.14% against 2% respectively. No significant difference was observed for other side effects: hyperthermia (p=0.123). Nausea (p=0.123). Vomiting (p=0.498) in their study. Nialm S *et al*[14] in their study, also showed the occurrence of side effects is much higher in misoprostol group than oxytocin group. E.R. Othman *et al*[18], in their study showed shivering and metallic taste were reported in the misoprostol group more than in the oxytocin group. In the present study the mean blood loss level for Misoprostol group (185.13) was higher while compared to Oxytocin group (180.07). While analyzing in terms of mean blood loss level in both groups we found no statistically significant difference. Diallo M *et al*[16] in their study showed there was no significant difference in the amount of blood loss between the two groups during our trial. The dose of 400 mcg of misoprostol administered per os, per lingual. Or even rectally (10-22) was as effective as oxytocin 10 IU IM[19]. In these studies, the average volume of blood loss varied between 155 ml and 193.5 ml in patients who received misoprostol; close to the average volume of 185.13 ml observed in our study. However, Villar in a systematic review that focused on the use of misoprostol in preventing early postpartum haemorrhage indicated the greater effectiveness of other conventional uterotonics (oxytocin, methylergometrine) for the reduction of blood loss during delivery compared to misoprostol[20]. We noted no statistically significant difference between the two groups based on the average hemoglobin levels before and after delivery. Cook who noted a higher reduction in hemoglobin levels in the misoprostol group (400 mcg per os) compared to the control group (oxytocin or syntometrine) suggested a greater effectiveness of this combination therapy[11]. However. Our results are consistent with those of Bulgaho, Walley, Zachariah, Afolabi and Caliskan who orally or rectally administered doses of 400 to 500 mcg of misoprostol comparing it to oxytocin or syntometrine[19]. Bellad observed a greater effectiveness of 400 mcg of misoprostol via the perlingual route over 10 IU IM oxytocin[21].

CONCLUSION

The above results indicate that in the context of active management of 3rd grade labour, Misoprostol has comparable effectiveness to oxytocin (10IU IV in 500ml RL) in the prevention of early postpartum haemorrhage However, misoprostol was associated with higher incidence of shivering and pyrexia but no other serious adverse effects occurred. Hence, per rectal misoprostol can be safely used in low risk caesarean deliveries as an alternative to 10 IU oxytocin in AMTSL It should be included as an alternative in delivery protocols and also added to the list of essential drugs for affordable access. In the future it may be an important and effective option for the management of third stage labour particularly in women where oxytocin is contraindicated.

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