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A comparative study of rectal misoprostol to oxytocin infusion during cesarean delivery to reduce intra operative & postoperative blood loss

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Abstruct:

Objective: we compare the effect of rectal misoprostol & oxytocin intraoperative bleeding & hemoglobin level & post operative bleeding.Study design: in this study 100 pregnant women candidate of elective cesarean section (CS) were randomally allocated in one of two group of patient receiving either 600mg of misoprostol, rectally other group receive intravenous oxytocin, after delivery of baby. Intraoperative bleeding, haemoglobing level before & 24hr after. Operation, Mean arterial Blood pressure, heart rate before & after the administration of the drugs.

Result:

There was no difference between the two groups in age, duration & numbers of pregnancy & surgery. The amount of blood lost in Misoprostol group & in oxytocin croup was not significant. A decrease in haemoglobin leval in 2 group was not stalically significant. Changes in the mean arterial pressure & heart rate only significant in oxytocin group.

Sheivering was significantly more common. In misoprostol group & respiratory distress in the oxytocin group. Other advers effect were equally seen in both group.

Conclusion:

Misoprostol is an. Appropriate alternative for intraveuous oxytocin in patient undergoing Cesarean section with lesser side effect & longer duration of action.

Introduction

Cesarean delivery in the most common surgical procedure performed on women worldwide and its rates continues to rise steadily in both developed and developing countries.(1)

Post partum haemorrhage (PPH) is a major cause of maternal mortality, especially in under – resourced Countries, accounting for nearly one – quarter of all maternal deaths world wide.

The most common cause of PPH is the failure of the uterus to contract adequately which is responsible for approximately 70% of primary PPH with the increasing incidence of Caesarean section. PPH. May be more common because the average blood loss during a Caesarean section is twice that during vaginal delivery.(2)

Post partum haemorrhage (PPH) is defined as a blood loss of more than 1000ml is the first 24hr. following cesarean section. PPH is the leading cause of maternal mortality world wide and the number. Of maternal deaths due to post parting haemorrhage is estimated to exceed 100,000 maternal death each year.(3)

Although most obstetric units use intravenous oxytocin, given as either a bolus or an infusion as a first line agent to prevent uterin atony and reduce blood loss during lesarean section, 10 – 42% of women receiving oxytocin were found to require additional oxytocic agents, such as ergot alkaloids and prostaglaudine.(4)

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- Misoprostol is a synthetic PGE_1 analogue, owing to its uterotonic properties, it is now one of the most popular drug in obstetric.(5)
- The low Cost of drug safly & stability, and the ease of administration through multiple routes make it a good option in poor setting and in patients who are vomiting or under anaesthesia.(6)

More recently, it has been shown to be a potent uterotonic agent & has been investigated in the induction of abortion, cervical priming and induction of labour, used either alone or Combined with Mifepristone.(7)

Absorption of misoprostol is very rapid, being detected in the circulation within 2min of its oral ingestion.(8)

its effect on the early pregnant uterus has been shown to be very rapid(9) and does not cause hypertension.(10 – 11)

- In a pharmacokinetic study, rectal administration of misoprostol was found to be superior to oral administration for mangment of 3rd stage of Labour and rectaly administrated misoprostol has also been used with promising result for the prevention and control of PPH after vaginal birth.(12-13)

Material & Methods

This is a prospective randomized Control trials was conducted at Al-Zahraa teaching hospital of Alkufa university in Al-Najaf city From Jan 2013 – December 2015.

We enrolled 100 women undergoing elective cesarean delivery under spinal anaesthesing.

1- Inclusion criteria:

Patient included in this study where those not in active lubor., had reactive non stress test, had no hypersensitivity or contra indication to be prostaglandin had no History of coagulopathy.

2- Exclusion criteria:

- a case of twin pregnancy.
- Fetal distress.
- Pregwancy induced hyperteusion.
- Oligo – or poly hydromonious.
- Macrosomy.
- More than four delivery.
- Help syndrom.
- Coagulation disorder.
- Sensitivity to prostaglandin.
- Asthma.
- Heart, lung, liver disease.
- Previous more than three cesarean section.
- Myomectoy or any other abdominal operation.
- Patient with febril diseas.

After approval by ethics committes of the hospital & obtaining written informed consent, patient were allocated to one of the two study groups.

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Using a table of a random numbers, receiving either. 600mg rectal misoprostal tab (3 tablets, each tabe = 200mg misopristol) after incising the uterovesical fold of the peritonem before the uterine incision.

The surgon and the assistant elevate the draping to allow the nurs to administer three moistened misoprostol group (1) by the rectal rout.

– Women in group (2) received intravenous infusion of oxytocin (20 unit of oxytocin in 500ml of Ringer lactate solution after delivery of the baby, at a rat of 5ml per 30 minute up to the end of operation. all of the procedures were prefomed by surgon . with more than ten years experiences in this field.

During the operation an isolated suction was used for evacuation of amniotic flied through a small incision over the uterus and another one used for collection of blood.

Every small gauge soaked with blood was considered to contain 20ml, and every large one 50ml of blood, and every gram increase in the patients gown weight considered 1ml of blood.

These items added to the amount blood collected in section and calculated as the total amount of blood loss.

Haemoglobin level was measured before and 24 hour after the operation, blood pressure and puls rate was measured before the operation, 3 minute & after and every 5 minutes during the procedure, shivering, number of nausea and vomiting along the operation and up to 2 hrs. after it, was recorded.

Oral Temperature was also recorded in 20, 40, 60 minutes after the operation.

Temperature above 40 degree was Considered as hyper pyrexia.

On the basis of previous studies the Mean amount of blood ,loss with the use of oxytocin during cesarean is 600CC, and misoprostol can reduce it by 200ml[31].

So Considering 90% power and 5% error the sample size was determind to be 50 cases in each group.

Data was analyzed with spss software using chi – square an T – Tests.

Result

There was no difference between the groups in age, duration of pregnancy, duration of operation & numbers of pregnacis.

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Table (1) Mean $\pm SD$ of age, number and age of pregnancy, and duration of operation in the two study groups

Variable	Misoprostol group	Oxytocin group	P – value
Age: (years	25.2 ± 5.4	28.5 ± 5.1	0.60
Duration of pregnancy (WK)	38.66 ± 56	38.68 ± 0.89	0.93
Duration of operation (min)	38.5 ± 5.6	40.42 ± 6.2	0.12
Nbr. Of pregncy	1.86 ± 0.92	1.91 ± 0.85	0.72

There were no difference in pre – operative and post operation haemoglobin concentration as well as the amount of intra operative blood loss between the two groups.

Table (2) Mean $\pm SD$ of amount of intraoperative bleeding and mean pre, and post – operative haemoglobin level in the two study group

Variable	Misoprostol group	Oxytocin group	P – value
Hb pre operation (g/dl)	11.35 ± 1.02	12.28 ± 0.82	0.73
Hb post operation (g/dl)	10.32 ± 0.81	11.20 ± 0.60	0.35
Intra operative bleeding (ml)	574 ± 165	600 ± 200	0.38

Hb = haemoglobin

There was no significant changes in the mean arterial pressure before (82.4 ± 15.5 mmHg) and after ($75.2 \pm 14.6\ mmHg$) (P = 0.22) after administration of rectal misoprostol while there was a statistically significant drop before (82.3 ± 12.2 mmHg) and after (72.1 ± 10.5 mmHg) (P = 0.002) intravenous administration of oxytocin.

The heart rate of patients in oxytocin group significantly increase from $102 \pm 17\ beats/min$ to $123 \pm 22\ beats/min$ (P = 0.005).

There was no change in the heart in the palients who received rectal misoprostol ($95 \pm 21\ Vs\ 98 \pm 28$).

Comparison of the side effect revealed that shivering in misoprostol and respiratory distress in oxytocin group. Were significantly different from the other group. The difference of other side effects was not significant (table 3).

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Table 3 The comparison of the side effects during and after operation in the two Study group

Variable	Misoprostol group	Oxytocin group	P – value
Transfusion	0	0	N.S
Nausea	4	5	N.S
Vomting	2	3	N.S
Shivering	8	1	0.03
Hyper pyrexia (> 40C)	3	1	N.S
Chest pain	1	6	0.03

The incidence of shivering was statistically higher in the misoprostol group while the incidence of chest pain was statistically higher in the oxytocin group.

Other side effect were not statistically different between the two group (table 3).

Discussion

- Despite routine use of oxytocin during Cesarian delivery, a number of women. Especially those at high risk may develope uterine atony and haemorrhage. either during surgery or in the immediate postoperative period with serious Consequences. Any modality of treatment which helps in its prevention will be useful in reducing maternal mortality & morbidity.
- In this study there is no significant difference between intra – operative bleeding & post operative Hb level in patients reciving either rectal misoprostol or intra venous oxytocin.
- Conde – Agudelo *etal.*[14] in their study found. There were no significant differences in intraoperative and post-operative haemorrhage. When misoprostol was compared to oxytocin. Also found misoprostol combind with oxytocin appears to be more effective than oxytoxin alone in reducing intra operative & post opcrative haemorrhcege during caesarean section.
- In Chaudhuri *etal.*[15] study with 800mg rectal misoprostol there was no significant difference in Haemoglobin level post operatively but the intra – operative bleeding was significantly lesser in misoprostol group.
- In Vimala *etal.*[16] in their study on comparison of 400mg sub lingual misoprostol with oxytocin found that intra – operative bleeding was more significant in oxytocin group, although postoperative hemoglobin level was not different.
- In Lapaire study.[17] with 800mg oral misoprostol the amont of bleeding and hemoglobin levels 24, and 48hr postoperative were similar with oxytocin group.
- In Hamm[18] compairing 200mg buccal misoprostol with oxytocin there was no difference between intra – operative bleeding and 24hr. post operatve Hb level. In the two groups.
- Although in diffirent studies intra operative blood loss was equal between the two groups but intra operative blood loss with the use of misoprostol has a wid ranged from 500ml to 1000ml.[19]

This wide rauge of blood loss may be due to diffrences in the dose, route & timing of adminstration of misoprostol. Chaudhuri[19]. used 800mg rectal misoprostol before making Incision on the uterus followed by infusion of 6 mints of oxytocin in a half an hour. Vimala used 400mg of sublingual. Misoprostol & 2 mints of oxytocin in half an hour, on other hand, in these studies, a similar method has not been used to estimate the amount of amniotic flind & its admixture with blood which may result in inaccurate estimation of blood loss.

- the rate of blooding and the hemoglobin changes found in our study was similar to most others studies. The difference between our study & that of chaudhuri may be due to the high dose of oxytocin in our study & lower dose of misoprostol (600mg versus 800mg).
- changes in blood pressure and heart rate are side effects of oxytocin.
- In our study decrease in mean artercial blood pressure and increase in heart rate were significantly more common in patients receiving oxytocin. Several studies have been done on haemodynatic changes resulting from the use of oxytocin.
- Thomas[20], Svanstrom[21] and coworkers showed that oxytocin reduces mean arterial blood pressure and peripheral vascular resistance, imcaease heart rate and creates ST – segment changes and consequently will lead to chest pain.

This study showed that the oxytocin receiving group had significantly more decrease in blood pressure and increase in heart rate than misoprostol group and dyspnea and chest pain were more common in this group as well.

These similar changes are reported in many other studies.[20] [21] [22]

- Shivering is a side effect of misoprostol and is dependent to the kind of anaesthesia, temperature of the operation room, and fluides used during the procedure.[23]

We used fluids with 37 degrees of centigrade (either IV or irrigation) and room tempreture was 25 centigrade in the other hand epidural anaesthesia was not used in our study because shivering is more common. In epidural anaesthesia. In our study shievering was significant in misoprostol group and this is comparable to Vimala *etal.*[16] & Chaudhari *etal.* [15][19]

The difference of nausea and vomiting in the two group was not significant. Similar findings were reported in previous studies. [16][17][19]

- Hyper pyrexia was not significant in the two group. & this is similar to the previous study.[17][19]

Conclusion:

Rectal misoprostol is an appropriate alternative for intravenous oxytocin in patients undergoing Cesaren section, with a lesser side effects and longer duration of action.

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