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Case Report

ACTIVE MANAGEMENT OF THIRD STAGE OF LABOUR IN LOW RESOURCE SETTING: SUBLINGUAL MISOPROSTOL OR INTRAMUSCULAR OXYTOCIN

Rajoria Lata, Verma Asha, *Hooja Nupur, Hemani Sunita, Verma Kusumlata and Moolchandani Rekha

Department of Obstetrics and Gynaecology, Zenana Hospital, S.M.S. Medical College, Jaipur, Rajasthan, India
**Author for Correspondence*

ABSTRACT

The objective behind the study was to compare the outcome of 400 mcg sublingual misoprostol with 10 IU intramuscular oxytocin in active management of third stage of labour. Prospective randomized controlled clinical trial was done at Tertiary care centre - S.M.S. Medical College, Jaipur. Pregnant women with >28 weeks of gestational age, singleton pregnancy and cephalic presentation were taken for the study. In Group –A 400mcg sublingual misoprostol and in Group –B 10 IU intramuscular oxytocin was given immediately after delivery of baby. Main Outcome Measured was duration of third stage of labour and amount of blood loss. Secondary outcomes measured were drop in haemoglobin level, need for manual removal of placenta, operative intervention for PPH and side effects of drugs. The results were subjected to statistical analysis using chi-square test and student't' test. Both drugs were equally effective regarding duration of third stage, mean fall in haemoglobin level (0.45 gm% in group A and 0.48 gm% in group B) and mean blood loss (210.15 ml in group A and 223.65 ml in group B, $p > .05$). Significant difference was observed in occurrence of side effects like shivering which was significantly higher with the use of misoprostol ($p < 0.05$). Sublingual misoprostol is as effective as intramuscular oxytocin in active management of third stage of labour and a good option for low resource settings.

Key Words: *Misoprostol, Active Management of Third Stage of Labour, Post Partum Haemorrhage*

INTRODUCTION

Haemorrhage remains the leading cause of maternal mortality, accounting for approximately 25% of deaths. Common causes of Postpartum haemorrhage (PPH) are atonic PPH, traumatic PPH and retention of placental tissues, the first one being the most common (World Health Organization, 1998). Postpartum blood loss is difficult to evaluate especially in developing country like India where most women are anaemic with poor reserve and the condition is further aggravated by increased demand during pregnancy, so even a small reduction in amount of postpartum blood loss can reduce maternal morbidity and mortality. WHO suggests that Active Management of Third Stage of Labour (AMTSL) should be offered to all women during childbirth for prevention of postpartum haemorrhage (WHO, 2009) AMTSL includes administration of prophylactic uterotonic agents immediately after birth of baby, delivery of placenta by controlled cord traction and uterine massage.

Several drugs reduce postpartum haemorrhage by causing the uterus to contract. Ergot derivatives and oxytocin are the drugs used in some centres. Misoprostol, a prostaglandin E_1 analogue and prostaglandin $F_{2\ alpha}$ are also effective uterotonics in case of PPH. Moreover, most uterotonics require injectable route of administration, requiring training of safe administration and are unstable at room temperature. These are unavailable for most women in low resource settings. Misoprostol is heat stable and can be administered by sublingual, oral, rectal and vaginal routes (Oj Shan Tang *et al.*, 2002).

Sublingual route for misoprostol was identified as having the greatest potential for the treatment of PPH because of its rapid uptake, long lasting duration of effect and greatest bioavailability compared with other routes of administration (Oj Shan Tang *et al.*, 2002). Misoprostol reduces the incidence of PPH and is ideal in poor resource setting and home deliveries because it requires no special skill to administer.

Case Report

Aim and Objectives

To compare the outcome of sublingual misoprostol with intramuscular oxytocin in active management of third stage of labour.

MATERIALS AND METHODS

Methods

This hospital based randomized clinical trial was conducted in the department of Obstetrics and Gynaecology, S.M.S. Medical College, Jaipur, Rajasthan from June 2011 to September 2012 after obtaining the ethical committee approval.

332 low risk females were involved in two arms of the study. The purpose of the study was explained to them and a written consent was taken from each of them. On admission in the labour ward, eligible females were randomized in two groups A and B. those in group A received 400 mcg Misoprostol sublingually immediately after delivery and clamping of the cord while group B females received 10 U intramuscular oxytocin immediately after delivery of baby. Both groups were studied for amount of blood loss, duration of third stage, drop in haemoglobin, incidence of PPH and side effects of drugs. Sample size was calculated as 166 women in each group (total 332) using 80% study power and 0.05 alpha error assuming SD of 100 ml of blood loss and minimum difference of 35 ml of mean blood loss between both groups .

A detailed history, complete general and local examination was done and blood sample was obtained for haematocrit analysis. After delivery of the baby, women in the two groups received either Misoprostol or Oxytocin as explained. Cord was clamped and cut and placenta was delivered by controlled cord traction. Fundal massage was done after delivery of placenta to keep the uterus contracted. The amount of blood loss was measured by a calibrated plastic blood collection drape placed under the buttocks of the parturient in the immediate post partum period. Duration of third stage of labour, incidence of PPH, need for manual removal of placenta, use of additional uterotonics and any operative intervention required were noted. One hour after delivery, the women were asked about the side effects of the drugs. After 24 hours of delivery, a blood sample was taken for haemoglobin and haematocrit analysis. Data obtained was recorded in computer and statistical significance was elicited using student t test and chi- square test.

RESULTS AND DISCUSSION

Results

This predictive study evaluated 332 females (166 in each group). No statistical difference was found in the demographic variables like age, parity, period of gestation, literacy and socio-economic status of women in the two groups (p value >0.05). Majority of women in the two groups delivered at term and around 68% women in both the groups required augmentation with oxytocin. Episiotomy was given in 61.64% women in group A and 69.88% in group B. Table 2 suggests that PPH did not occur in any patient. Mean duration of third stage was 5.94 minutes and 5.89 minutes in group A and B respectively. The average blood loss was comparable in both the groups. Blood transfusion was required in one patient in group A and in two patients in group B. Misoprostol showed more side effects than oxytocin. Shivering was statistically higher with misoprostol than oxytocin ($p < 0.05$).

Discussion

PPH is an unpredictable cause of maternal death worldwide. Uterine atony is the most common cause of PPH. It is perhaps most amenable to treatment. In developing countries like India, a large number of deliveries take place in rural areas far away from the tertiary care centres. In these areas, inexpensive drugs with simple routes of administration and minimum side effects are required. These deliveries are attended by birth attendants and not by doctors. Several drugs have been used for prevention of PPH with varied level of success. Misoprostol is thermostable, easy to administer and a safe drug in PPH prevention. Oxytocin, on the other hand, has to be administered intramuscularly and should be stored at cooler temperature. In our study we have seen almost similar efficacy of the two drugs in duration of the

third stage, average blood loss and mean change in haemoglobin. Savita Singhal *et al.,* (2010) observed that the mean duration of third stage of labour in women receiving 400mcg misoprostol sublingually was 6.2 minutes while it was 5.6 minutes for those receiving injection oxytocin 10 units intramuscularly. Mean blood loss during the 24 hours following delivery was 210 ml in group A and 223 ml in group B. This was comparable to observations made by Savita Singhal *et al.,* (2010) who found a loss of 260 ml in misoprost and 264ml in oxytocin administered group. Sukhvinder Kaur Bajwa *et al.,* (2012) studied that average blood loss was less in women receiving 400mcg misoprostol sublingually (210ml) than those receiving the drug by rectal route (230ml). Robert L Walley *et al.,* (2000) found a mean blood loss of 190 ml with 400mcg oral misoprostol and 187 ml with 10 IU i.m. oxytocin. Afolabi *et al.,* (2010) found an average blood loss of 155 ml with 10 IU i.m. oxytocin and153ml with 400 mcg misoprostol. The blood loss in the above two studies is less than that in our study.

Table 1: Baseline and delivery characteristics

Variable	Group A	Group B	p - Value
Mean age in years (Mean age ± S.D.)	23.60 ± 3.79	23.24 ± 3.56	> .05
Gravid State			
G1 n(%)	68 (40.9)	68 (40.9)	> .05
G2 n(%)	57 (34.3)	61 (36.7)	> .05
G3+ n(%)	41 (24.6)	37 (22.3)	> .05
Gestational Age in Weeks			
35-37 n(%)	22 (13.2)	24 (14.4)	> .05
38-40 n(%)	127 (76.5)	126 (75.9)	> .05
41-12 n(%)	4 (2.4)	5 (3.01)	> .05
Mode of Labour			
Spontaneous n(%)	53 (31.9)	52 (31.3)	> .05
Augmented n(%)	113 (68.1)	114 (68.7)	> .05
Need of Episiotomy			
Present n(%)	107 (65.6)	116 (69.9)	> .05
Absent n(%)	59 (35.5)	50 (30.1)	> .05

S.D. = Standard Deviation

Some guidelines note that pre and post delivery haemoglobin levels should be considered when diagnosing cases of PPH. We have found a statistically significant difference in pre and post delivery haemoglobin levels in both the groups. 0.45 gm% fall in Hb level loss was seen in group. A while in group B it was 0.48gm%. Savita Singhal *et al.,* (2010) observed a fall of 0.52 gm% in sublingual misoprostol group and 0.5 gm% in 10 U Oxytocin group. Steven M Parsons *et al.,* (2007) found that change in Hb level was 1.19gm% and 1.16 gm% in the two groups respectively. Vimala *et al.,* (2004) found that the change in Hb levels 24 hour post partum was 0.7 gm% in their study group receiving 400 mcg Misoprostol.

Shivering was the most common side effect with misoprostol. Shivering and fever were the most common side effects observed with misoprostol in studies by Savita rani Singhal *et al.,* (2010), Kola M Owonikoko

et al., (2011), Caliskan *et al.,* (2002), Rehan Uddin Khan and Hazeem El Rafaey (2003) observed that shivering was most common with oral and least with sublingual misoprostol.

Table 2: Comparison of Changes in Hemoglobin, duration of third stage, blood loss and need for blood transfusion

Variable	Group A n = 166	Group B n = 166	p - Value
Mean duration of third stage (minutes ± S.D.)	5.94 ± .44	5.89 ± .44	> .05
Mean blood loss in 24 hours (ml. ± S.D.)	210.15 ± 44.95	223.65 ± 55.58	> .05
Mean pre-delivery Hb level (Hb in gm/dl ± S.D.)	10.38 ± 1.05	10.14 ± .91	> .05
Mean post delivery Hb level (Hb in gm/dl ± S.D.)	9.93 ± .93	9.66 ± .87	> .05
Mean change in Hb level (Hb in gm/dl ± S.D.	0.45 ± .31	0.48 ± .23	> .05
Need of blood transfusion n(%)	1(.6)	2 (1.2)	> .05

Hb = Hemoglobin

Table 3: Profile of side effects in the study

Variable	Group A n (%)	Group B n (%)	p - Value
Shivering	12 (7.22)	3 (1.81)	< .05
Pyrexia	5 (3.01)	2 (1.2)	> .05
Nausea	8 (4.81)	3 (1.81)	> .05
Vomiting	2 (1.2)	1 (.6)	> .05
Diarrhoea	2 (1.2)	0 (0)	

Conclusion

PPH, a leading cause of maternal deaths in developing countries can be prevented to a large extent by active management of third stage of labour. Intramuscular oxytocin and misoprostol by various routes are effective uterotonics. Sublingual Misoprostol 400 mcg can be a miraculous drug at the level of peripheral health centres due to its simplicity in the use regarding route of administration, thermostability, shelf life of years and low cost .

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