Where does ergometrine stand in prevention of postpartum haemorrhage in caesarean section?

Ghazala Mahmud, Kiran Javaid, Nasira Tasnim, Arfa Tabassum, Kausar Tasneem Bangash

Abstract

Objective: To compare the safety and efficacy of 10 units of intravenous syntocinon alone with 10 units intravenous syntocinon and 0.25mg intramuscular ergometrine in the prevention of atonic uterine haemorrhage during caesarean section.

Method: The quasi-experimental study was conducted at the Maternal and Child Health Centre, Unit I, Pakistan Institute of Medical Sciences, Islamabad, from November 1, 2010 to February 28, 2011. All women undergoing caesarean section were included in the study. Patients were given intravenous 10 units syntocinon alone intra-operatively from November 1 to December 31, 2010, while 0.25mg ergometrine intramuscular was added to 10 units intravenous syntocinon from January 1 to February 28, 2011. Frequency of postpartum haemorrhage, adverse effects of drugs and maternal morbidity and mortality were assessed by using chi square test. P <0.05 was taken as statistically significant.

Results: Of the total number of 701 subjects, 378 (54%) women were given 10 units syntocinon and 323 (46%) were given 0.25mg ergometrine in addition to 10 units syntocinon. The mean age in the syntocinon group was 28±3.5 yrs with gestational age of 37.5±2wks, while that in syntocinon-ergometrine group was 29±3.4 years and 38±2 weeks respectively. Postpartum haemorrhage in the syntocinon group was found in 38 (10%) women versus 05 (1.5%) women) in the other group (p<0.001). Adverse effects like nausea, vomiting and raised blood pressure were slightly more with syntocinon-ergometrine than syntocinon alone (n=56; 15.3% vs n=35; 9.2%), but it was not statistically significant. Post partum haemorrhage was responsible for 40% of maternal mortality during the study period and that was in the syntocinon group.

Conclusion: Prophylactic ergometrine in addition to syntocinon is superior to syntocinon alone in decreasing frequency of postpartum haemorrhage in caesarean section and associated maternal morbidity and mortality. Regarding safety profile, the two groups showed no statistically significant change.

Keywords: Ergometrine, Syntocinon, Caesarean, PPH. (JPMA 64: 911; 2014)
protocol, the incidence of PPH at our unit over the past 10 years is around 1%, as shown in Figure-1. Following a single incidence of cerebral haemorrhage in Oct 2010 (which later turned out to be Arteriovenous Malformation), the protocol of IV syntometrine during CS was replaced by 10 units IV syntocinon by anaesthetist, as per Royal College of Obstetricians and Gynaecologists (RCOG) and World Health Organisation (WHO) recommendations. Following this regimen a sharp rise in incidence of PPH was observed. Detailed audit was conducted in addition to 24-hour labour ward report to find out the reasons behind this increase in PPH. Unit protocol was revised and women were given 0.25mg IM ergometrine in addition to 10 units IV syntocinon from January 1 to February 28, 2011. Maternal blood pressure (BP) was recorded preoperatively, immediately after CS and then hourly for 6 hours afterwards. Patients were kept under observation in high dependency area for 6 hours. Detailed history, clinical examination and co-morbid diseases such as diabetes mellitus, cardiac disease, hypertension, pre-eclampsia and poly-hydraminos etc. were recorded into a structured proforma. The primary outcome measures were the frequency of PPH and drug-related side effects. Secondary outcome measures were PPH-related maternal morbidity and mortality. The data was analysed by using SPSS version 10. Chi square test was used to compare the efficacy and safety of the two drugs. P value less than 0.05 was taken as statistically significant.

**Results**

The study comprised 701 subjects (Figure-3). Of these, 378 (56%) women were given 10 units IV Syntocinon from November 1 to December 31, 2010, and 0.25mg IM ergometrine and 10 units IV syntocinon was given to 323 (44%) women from January 1 to February 28, 2011. The mean age in syntocinon group was 28±3.5 years with gestational age of 37.5±2wks, while that in syntocinon-ergometrine group was 29±3.4yrs and 38±2wks respectively (Table-1). Almost 30% of women in both groups were nulliparous (28 vs. 26) (Table-1). Both the groups were comparable regarding indications of CS.

Our results showed that the frequency of PPH in...
syntocinon group was significantly more than syntocinon-ergometrine group (n=38; 10% vs. N=05; 1.5% respectively, p<0.004). It was twice in emergency CS compared to elective CS in both groups (Table-2).

Regarding the safety profile, adverse effects (nausea, vomiting, raised BP) were observed slightly more in syntocinon-ergometrine (n=56; 15.3%) group than syntocinon (n=35; 9.2%), though it was not statistically significant (Table-3).

Syntocinon alone resulted in increased maternal morbidity such as anaemia and need for blood transfusion than syntocinon-ergometrine group (Table-4). Surgical interventions were done more in the syntocinon group with increased number of hysterectomies (n=12;3.1%), half of which were done due to uterine atony while only one (8.3%) patient required hysterectomy in syntocinon-ergometrine group and that too was a case of placenta parevia. PPH was responsible for 40% of maternal mortality during the study period and that too was in the syntocinon group.

### Discussion

The evidence that prophylactic uterotonics during CS reduce the frequency of PPH has been established for the last 17 years, thus decreasing the need for blood transfusion, postpartum anaemia and less use of additional therapeutic uterotonic drugs. However, there is no consensus on the ideal uterotonic and its route of administration. WHO and RCOG recommend 5 units of IV syntocinon in preference to ergometrine, syntometrine (5IU syntocinon plus 0.5mg ergometrine) or misoprostol, for prevention of PPH during CS.4,5 Ergometrine was withdrawn in the early 1980s because of its adverse effects. Since then, multiple randomised controlled trials have been conducted on the subject, but all of them were done in women undergoing vaginal delivery and used 0.5mg of ergometrine6-9 unlike our study which was done with 0.25mg ergometrine in women undergoing CS.

The frequency of PPH after CS in our study was 6.1% (43 women). Local studies have reported lower frequencies of 1.58%10 and 1.2%11 while higher incidences of 7%12 and 9.5%13 have also been reported in literature. Our study showed that syntocinon-ergometrine combination is significantly associated with decreased frequency of PPH compared to syntocinon alone. Although, adverse effects were observed slightly more with syntocinon-ergometrine combination, but it was not statistically significant. Similar results have been shown by a study which showed that addition of 0.5mg of ergometrine to 5 units syntocinon during CS resulted in reduced number of massive PPH due to atonic uterus with an increased incidence of nausea and vomiting.14 Our results were, however, contrary to the Cochrane review which showed that ergometrine-syntocinon was more effective than syntocinon alone for preventing minor PPH with significantly more side effects.8
Anaemia was seen more in syntocinon alone group compared to syntocinon-ergometrine with increased number of blood transfusions in this group. This was in contrast with the Cochrane review which showed no difference in necessity for blood transfusion in both groups.

Surgical interventions were done more in the syntocinon group compared to the syntocinon-ergometrine combination, as 12 (3.1%) women in the syntocinon group ended up with hysterectomy; a result similar to an earlier study.

Almost half of the hysterectomies were done due to uterine atony which is comparable to that reported by other researchers. Maternal mortality due to PPH in the syntocinon group in our study was 40%; similar to that reported earlier. Comparable mortality rates due to PPH have been reported in Indonesia, Philippines and Guatemala.

As the reason of withdrawal of ergometrine was its safety profile, it may be hypothesised that these side effects are dose-dependent, as we used 0.25mg ergometrine in our study unlike all the other studies reported in the literature. Our study also showed significant reduction in maternal morbidity and mortality with the use of syntocinon-ergometrine combination. This issue has not been addressed in any other study before.

Hence, withdrawal of ergometrine altogether is not justified, especially in developing countries like Pakistan, where there are limited health resources and facilities like blood products, and health personnel are not available round the clock. We strongly feel that there is a need for its reappraisal in tertiary care hospitals where its storage and administration is not an issue.

**Conclusion**

The study showed that prophylactic IM ergometrine in addition to IV syntocinon is superior to syntocinon alone in decreasing incidence of PPH in CS and associated morbidity and mortality. Regarding safety profile, the two groups showed no statistically significant change. It is suggested that ergometrine should be given to at least high-risk PPH patients. However, the IV route may be replaced by IM route. As for the safety profile, randomised controlled trials should be done internationally using 0.25mg of ergometrine to establish the risk of PPH versus side effects of ergometrine.

**References**