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Efficacy of Misoprostol versus Syntometrine in the Prevention of Postpartum Hemorrhage

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Abstract

Background: To determine the efficacy and side effects of oral misoprostol versus syntometrine for prevention of primary postpartum hemorrhage.

Methods: Interventional study; Eighty patients were divided into two equal groups. Misoprostol 600 microgram single dose was given orally immediately after cord clamping to Group A. Syntometrine (consists of 10 IU oxytocin + 0.5mg ergometrine) was given intravenous to Group B. Patients were kept under observation for 6 hours. Pulse, blood pressure, temperature any need for other uterotonic drugs, estimated blood loss (<500ml or >500ml) haemoglobin percentage 6hours before and after delivery, need for blood transfusion, side effects, time and mode of delivery were noted.

Results: Differences in blood pressure and transfusion were statistically insignificant between two groups. Shivering and pyrexia was more common in Group A , and nausea, vomiting and hypertension in Group B

Conclusion: Like syntometrine, misoprostol can be used prophylactically orally during third stage of labour to reduce the incidence of Primary postpartum hemorrhage.

Keywords: Primary postpartum hemorrhage, uterine atony, Prostaglandins, oxytocin, ergot alkaloids.

Introduction

Primary postpartum hemorrhage remains a significant cause of maternal mortality and morbidity, responsible for 30% of maternal deaths .Uterine atony or failure of the uterus to contract following delivery is the most common cause of primary postpartum hemorrhage. [1-3]

Multiple uterotonic agents have been used for prevention of primary postpartum hemorrhage. Conventional oxytocic agents include oxytocin, syntometrine and prostaglandins. Oxytocin the ergot alkaloid and syntometrine are equally effective in reducing risk of postpartum hemorrhage and is associated with specific maternal side effects, like nausea, vomiting and headache. [4-5]

As compared to Syntometrine, Misoprostol has many advantages, as it can be given via variety of routes (oral,rectal,sublingual,vaginal); it does not need refrigeration; has a long shelf life; low cost and is stable at high temperature[6]. It is very effective for control of primary PPH, when given orally or rectally as 600 microgram .[7,8] Specific side effects of misoprostol are dose related and include, shivering, transient pyrexia, nausea and vomiting[9].

In many developing country settings where primary and referred level health facilities often do not have the necessary health personnel, supplies or equipment to administer conventional uterotonic drugs routinely, misoprostol represents a reasonable alternative agent for management of third stage of labour. In addition oxytocin, requires refrigeration, special storage, use of needles and syringes.

Patients and Methods

This interventional study was carried out over a period of six months from 17th April 2009 to 17th October 2009 in the department of Obstetrics and Gynecology at District Headquarter Teaching Hospital Rawalpindi. Using formula $n=Z^2 Pq/E^2$ Sample size was 80 women divided into two groups. 40 patients in Group A were given Misoprostol and 40 patients in Group B were given Syntometrine.

Women of all age groups, booked or non booked with singleton, term pregnancy with cephalic presentation undergoing spontaneous vaginal delivery were included in the study. Women with previous Caesarean Section, Grand Multiparty (>Parity 4), **a**naemia, systolic blood pressure > 140mm of mercury and diastolic >90mm of mercury, intrauterine fetal demise., **m**ultiple pregnancies, medical conditions including diabetes, cardiac ailments, seizures and bronchial asthma, obstetric complications i.e breech, pre-eclampsia and chorioamnionitis, and with history of complications (ante / postpartum hemorrhage, retained placenta / acute inversion of uterus) during previous pregnancy were excluded from study.

Single blind technique was used to avoid patient bias. Partogram was maintained and labour monitored routinely.

Misoprostol 600µg single dose orally immediately after cord clamping was given to Group A and Syntometrine (which consists of 10 IU oxytocin + 0.5mg ergometrine) was given to Group B.

Patient was observed for pulse, blood pressure, temperature, any need for other uterotonic drugs, estimated visual blood loss (< 500ml or > 500ml) hemoglobin percentage before and after delivery need for blood transfusion. Side effects, time and mode of delivery were also noted.

Paired sample t-test was used to compare hemoglobin before and after delivery and independent sample t-test was applied to compare blood loss in Misoprostol and Syntometrine groups. P value less than 0.05 was considered as significant.

Results

There were 15% primigravidas and 85% multigravida in Group A, while 10% and 90% respectively in Group B. In Group A 40% required Augmentation of labour as compared to 42.5% in Group B . In Group A 15% and in Group B 20% patients, required induction of labour (Table 1).

Table 1: Misoprostol Vs Syntometrine: Augmentation and induction of labour

		Misoprostol Patients (%)	Syntometrine Patients (%)
Augmentation of labour	Yes	16(40%	17(42.5%
	No	24(60%)	23(57.5%)
Induction of Labour	Yes	8(20%)	6(15%)
	No	32(80%)	34(85%)

There was no statistically significant difference regarding blood loss and blood transfusions between Group A and B(Table 2 ; fig 1)

There was statistically insignificant value difference in mean duration of stages of labour in both groups (Table 3).

In Group A, 5% patients experienced nausea and 20% experienced vomiting while it was 20% and 40% in Group B respectively. These side effects were statistically non-significant in both groups. In Group A, 45% patients experienced shivering and 30% had pyrexia which were statistically significant ($p<0.05$) while no cases of shivering and pyrexia were noted in group B (Table 4).

In Group B 13.3% patients experienced headache but it was statistically non significant. Hypertension was statistically significant in Group B while no cases were seen in Group A (p- value 0.040)

Table 2: Misoprostol Vs Syntometrine: Requirement of Blood Transfusion

	Misoprostol No. (%)	Syntometrine No. (%)
Yes	2(5)	1(2.5%
No	38(95%)	39(97.5%)

Table-3: Descriptive statistics for different stages stage of labour

	Group		Mini-mum	Maxi-mum	Mean	Standard deviation
1st	A	Misoprostol	4	9	6.5	2.5
	B	Syntometrine	3	9	6	3
2nd	A	Misoprostol	5	30	17.5	12.5
	B	Syntometrine	10	35	22.5	12.5

Table4: Comparison of side effects in both drug groups

Side Effects	Misoprostol No. (%)	Syntometrine No. (%)	p-Value
Nausea	1(5)	3(20%)	0.305
Vomiting	4(20%)	6(40%)	0.499
Shivering	9(45%)0	0	0.001*
Pyrexia	6(30%)	0	0.011*
Headache	0	2(13.3%)	0.152
Hypertension	0	4(26.6%)	0.04

*Significant at 5% Level of Significance

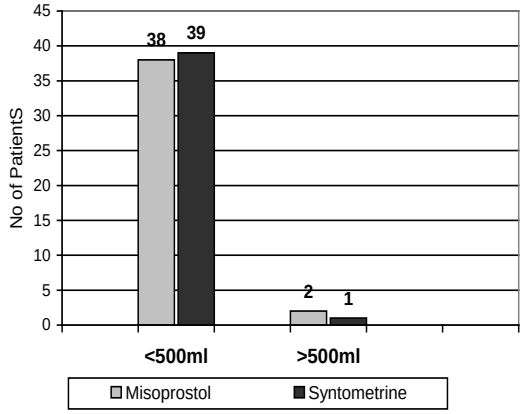

Fig 1: Blood loss for groups:

Discussion

An ideal agent used to prevent PPH as prophylaxis should be effective, convenient, safe and inexpensive. It should prevent PPH without significant side effects.

Misoprostol has powerful uterotonic effects and in this way prevents PPH like other uterotonic

agents. In contrast to oxytocin they are effective, safe and inexpensive. Misoprostol can be given via variety of routes (oral, rectal, sublingual, and vaginal): It does not need refrigeration, has a long shelf life and stable at high temperature. [10] Oral Misoprostol is associated with a significant reduction in the rate of acute severe postpartum hemorrhage. The drug's low cost, ease of administration, stability and positive safety profile make it a good option in resource-poor setting.[10].

Effective use of oxytocin requires refrigeration, sterile equipment for safe injection, and trained medical providers for administration. Given these constraints, misoprostol has been investigated as a potential alternative therapy for PPH prevention. Regarding side effects of Syntometrine a study conducted and published in 2007 concluded that ergot alkaloids in the third stage of labour significantly decreased mean blood loss and were associated with increased risk of vomiting, elevation of blood pressure and pain after birth requiring analgesia, particularly with the intravenous route of administration . [11]

Randomized controlled trials, comparing Misoprostol versus conventional injectable uterotonic in prevention of PPH, concluded that as a stable, orally active and cheap uterotonic, Misoprostol would appear ideally suited to the prevention of postpartum hemorrhage in the developing world. Misoprostol is therefore indicated for prevention of PPH in settings where injectable conventional uterotonics are not available[15].

Although effective methods for prevention and treatment of PPH exist such as oxytocin and ergot alkaloids, most are not feasible in resource poor settings where many births occur at home. Oral misoprostol is a potential alternative which could prevent postpartum hemorrhage in a community home birth setting.

In conclusion,Misoprostol is effective and cheaper alternative to Syntometrine in rural low resource settings, where the majority of deliveries take place at home without a skilled birth attendant present, and women face great risk of serious complication or even death from PPH due to limited access to emergency maternal health care services. The drug's low cost, ease of administration, stability at room temperature and a positive safety profile make it a good option in resource-poor settings.

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