Influence of umbilical vein oxytocin on blood loss and length of third stage of labour

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ABSTRACT

In this study the effect of intraumbilical vein oxytocin on duration and amount of blood loss in third stage of labour was studied. Pregnant women were randomized into two groups of fifty each. Study group was managed with 10 units of oxytocin diluted with 10 ml of normal saline given through umbilical vein while control group was managed with 10 units of oxytocin in 500 ml of normal saline through intravenous infusion after delivery of the baby. The mean blood loss in the third stage of labour was 143.30 ml for the control group and 151.43 ml for the study group while the duration of the third stage of labour was 6.02 and 5.42 minutes for each group. There was no significant difference in the duration and amount of blood loss between the two groups.

Keywords: PPH, Oxytocin, intraumbilical vein, third stage of labour.

INTRODUCTION

The third stage of labour commences with the delivery of the fetus and ends with completed delivery of placenta and its membranes. Complications may occur unexpectedly at this stage and unless prompt action is taken, serious maternal morbidity and sometimes mortality may occur. The most common complication is postpartum haemorrhage, which remains a leading cause of maternal mortality (25.0%) especially in developing countries.[1] Three to five percent of deliveries are complicated by PPH and is 50 times more common in developing countries.[2]

Active management of third stage of labour is implemented as a package including: 1.Early administration of an oxytocic during or after delivery of baby 2. Controlled cord traction to deliver placenta 3.Uterine massage.

Meta analysis of available data from randomized controlled trials revealed that active management of third stage of labour resulted in reduction of length and blood loss of third stage of labour and thus a reduction in Postpartum haemorrhage.[3-5]

The present study of injecting an oxytocin saline solution into the umbilical vein has been taken to evaluate its effectiveness in the management of third stage of labour with regards to its duration and blood loss in comparison with control cases where labour was managed with oxytocin saline solution through intravenous infusion route.

MATERIALS AND METHODS

This study was conducted in the department of Obstetrics and Gynaecology, BPKIHS, Dharan, Nepal in a period of one year from May 2002 to 2003.

Hundred low risks patients with vaginal deliveries were studied. Exclusion criteria were: maternal age more than 35, parity more than 4, previous caesarean section, multiple pregnancies, intrauterine fetal death, and pregnancy induced hypertension, antepartum haemorrhage, polyhydramnios, systemic illnesses and chorioamnionitis. Out of these, 50 were taken as study group and 50 as control group (selected randomly after taking detailed history and examination).

Study group (gr. A) - patients of this group received intraumbilical vein oxytocin (10 units of oxytocin diluted in 10 ml of normal saline) immediately after clamping the cord.

Control group (gr. B) - patients of this group received 10 units of oxytocin in 500 ml of normal saline drip through intravenous infusion route immediately after delivery of the baby.

In each group, cord was clamped immediately after delivery of the baby and placenta delivered by controlled cord traction. Blood loss was measured by placing a bedpan beneath the perineum of the patient and later measuring the collected blood in the pan in a measuring glass flask. Blood loss from episiotomy site was stopped getting collected in the pan by covering episiotomy area with pads. Time required for the duration of third stage of labour was noted with a stop watch.

RESULTS

In the age group between 15 – 24 yrs, there were 32 (48.5%) in the control group and 34 (51.5%) in the study group. In the age group between 25 – 34 yrs, there were 18 (52%) in the control group and 16 (47.1%) in the study group. Thus the maximum numbers (66) were in the age group of 15 – 24 yrs (Table -1). The maximum number of patients (56) were Primigravidas, among them 27 (48.2%) were in the control group and 29 (51.8%) in the study group (Table-2). There were 46 patients under the period of gestation of less than 40 weeks, among which 20 (43.5%) were from the control group and 26 (56.5%) were from study group. There were 54 patients under period of gestation of more than 40 weeks, among which 30 (55.6%) were from the control group and 24 (44.4%) were from the study group (Table-3). There were maximum numbers of patients (31) among blood loss between 51-100ml. Out of which 13 (41.9%) were in control group and 18 (58.1%) in study group. This shows that there is no significant difference in the amount of blood loss for each group.

The mean blood loss was 143.30 ml for the control group and 151.43 ml for the study group.

The mean duration of third stage of labour for the study group was 5.42 minutes and for the control group was 6.02 minutes. There is no significance difference in the duration of third stage of labour for each group. (Table-4)

DISCUSSION

The third stage of labour is defined as the duration from the birth of the baby until the complete expulsion of the placenta and membranes. Following delivery of the baby, uterine contractions coupled with the reduction in volume of the endometrial cavity will result in placenta being sheared off and separated from the uterus. Another mechanism of separation is through haematoma formation due to venous occlusion and vascular rupture in the placental bed caused by uterine contractions.

Administrations of prophylactic oxytocics like oxytocin, ergometrine, prostaglandins, syntometrine causes strong uterine contractions leading to fast retraction and separation of the placenta, thus making uterine atony a less common cause of postpartum haemorrhage.

Randomized trials have shown that active management of third stage of labour leads to several benefits as compared to physiologic management with an approximate 60.0% reduction in occurance of PPH,drop in postpartum maternal haemoglobin,need for blood transfusion and need of therapeutic uterotonics also reduced by 80.0%.[6-8]

Randomized comparisons of various oxytocics for the active management of third stage of labour to expedite placental expulsion time and minimize blood loss have been systematically reviewed.[9-12]

The concept of intraumbilical oxytocin was first devised by Golan *et al*.[13] Oxytocin injected into the umbilical vein reaches the placental bed in relatively high concentration. This stimulates uterine contractions, thus decreasing the placental attachment site. The resulting tension causes the decidua spongiosa to give way with the formation of a haematoma which then accelerates the process of placental separation and expulsion, thus resulting in a shorter duration and amount of blood loss in the third stage of labour.

Based on this principle, randomized trials have shown intraumbilical vein oxytocin for the active management of third stage of labour significantly reduces the duration and blood loss of the third stage of labour as compared to the traditional method of intravenous oxytocin.[14-16]

However studies of Chestnut and Cox[17] and Young *et al*[18] have found no significant differences between the two groups (one receiving intraumbilical vein oxytocin and another receiving oxytocin through intravenous infusion) with respect to placental expulsion time and amount of blood loss.

The present study is comparable with above studies which show no differences in the mean placental expulsion time and blood loss for both study and control groups. However intraumbilical oxytocin is a simple, inexpensive and noninvasive alternative to traditional method of intravenous oxytocin infusion and in conditions where intravenous fluids may have to be restricted for fear of pulmonary overload or in peripheral health centers where there may not be possible for intravenous access in all delivering patients; intraumbilical vein oxytocin seems to be equally efficacious method as the traditional method of intravenous oxytocin infusion for reducing duration of third stage of labour and amount of blood loss for prevention of postpartum haemorrhage.

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Table-1: Age group

Age group	Control	Study	Total
15 – 24	32 (48.5%)	34 (51.5%)	66
25 – 34	18 (52.9%)	16 (47.1%)	34

Table-2: Parity distribution

Parity	Control	Study	Total
Primigravida	27 (48.2%)	29 (51.8%)	56
Para 1	17 (50.0%)	17 (50.0%)	34
Para 2	5 (62.5%)	3 (37.5%)	8
Para 3	1 (50.0%)	1 (50.0%)	2

Table-3: Period of gestation

Period of gestation (weeks)	Control	Study	Total
< 40	20 (43.5%)	26 (56.5%)	46
>= 40	30 (55.6%)	24 (44.4%)	54

Table-4: Duration of third stage

Groups	Number of study	Duration of third stage in minutes		
		Minimum	Maximum	Mean
Control	50	3	30	6.02
Study	50	1	35	5.42

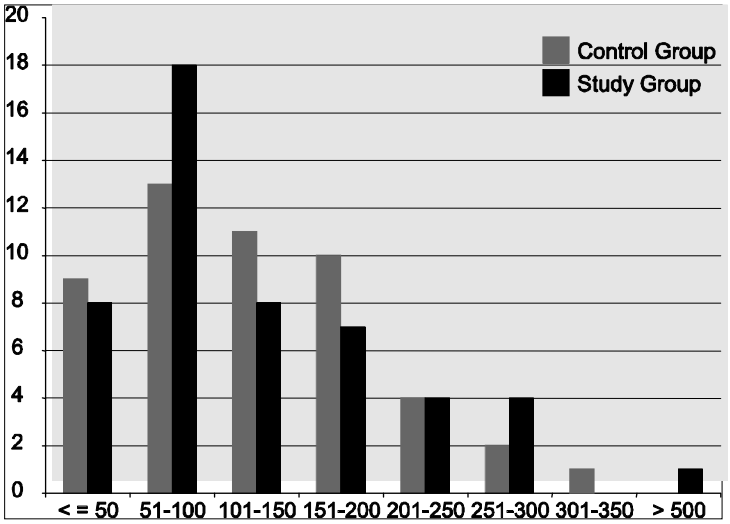

Fig. 1. Blood loss (ml)