

Effect of Placental Cord Drainage on the Duration of Third Stage of Labor

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ABSTRACT

Objective: To assess the effect of placental cord drainage on the duration of third stage of labor, and to assess the safety of this method regarding risk of postpartum hemorrhage, retained placenta, incidence of manual removal of placenta, and the need for blood transfusion.

Material and Method: A randomized controlled trial was carried out in gynae unit 4 of SGRH/ FJMC Lahore on 200 pregnant women. Out of these 100 cases were assigned to the study group and 100 cases to the control group. In the study group, placental cord drainage was performed. In both groups, the placenta was delivered by brandt Andrew method and inj oxytocin 10 units was given I/v at delivery of anterior shoulder. The duration of third stage was compared as the primary outcome. The incidence of postpartum hemorrhage, retained placenta, manual removal of placenta, and the need for blood transfusion were also compared between the two groups. Data was recorded on a Performa and t-test was used for statistical analysis.

Results: The average duration of third stage of labor was 5.02 ± 1.71 minutes in the study group and 7.42 ± 2.56 minutes in the control group. This difference was highly significant ($P < 0.001$). The average blood loss during third stage was noted to be 175.05 ± 118.15 ml in the study group and 252.05 ± 145.48 mL in the control group, which was significantly high ($P < 0.001$). There were two cases of retained placenta that required manual removal in the control group, no such cases were reported in the study group. One case of postpartum hemorrhage due to atony was reported in control group and required blood transfusion. No reported cases of postpartum hemorrhage in the study group.

Conclusion: Placental cord drainage shortens the duration of third stage of labour. This method appears to be safe and does not increase postpartum complication.

Keywords: Placental cord drainage, Third stage labour, Retained placenta, Postpartum hemorrhage

INTRODUCTION

Third stage of labor is complicated by hemorrhage in a significant percentage of labors. Postpartum hemorrhage (PPH) is the most common cause of maternal mortality in the world, accounting for approximately one-half of the 500,000 deaths per year. The vast majority of these deaths occur in the developing world. All pregnant women are at risk for PPH. Although risk factors for PPH have been identified, two-thirds of PPH occur in women without risk factors. There is evidence that the actions of caregivers during labor affect the incidence of PPH. The physiologic process of placental separation and expulsion, and control of bleeding is dependent on uterine contraction and retraction. Safe management of third stage is based on support for this physiologic process.¹

The third stage of labor is generally managed using two different approaches: "active management" and "physiological or expectant management". The former method involves administration of oxytocic drugs, clamping and

cutting the cord as well as controlled cord traction (modified Brandt-Andrews maneuver). The type and timing of the oxytocic drugs, route of administration, and timing of the cord clamping may vary considerably between practitioners.² The components of active management enhance the physiologic process by providing peak levels of oxytocics during third stage and assuring prompt emptying of the uterus so that it can retract fully. The latter form of management mainly involves maternal effort assisted by gravity and/or putting the baby to the breast without using artificial oxytocics or early clamping or controlled cord traction².

Drainage of placental blood from the cord after clamping and cutting has been observed to reduce blood loss and decrease the duration of third stage in women who had received prophylactic uterotonics.² Razmkhah in 1999 first reported that duration of third stage labor was significantly shorter when using the placental cord drainage method.³ Similar benefits from cord drainage were

demonstrated in low risk women who did not receive prophylactic oxytocics.⁴ In this form of management following early cord clamping and cutting, the placental end of the clamped cord can be released allowing free bleeding from the placenta. Unclamping the cord at the maternal side and releasing of the placental blood has been suggested for facilitating delivery of the placenta. It is physiologically plausible that draining blood from the placenta would reduce its bulkiness, allowing the uterus to contract and retract effectively leading to delivery of the placenta and may reduce the duration of third stage labor.⁵ Also, there is some evidence that placental cord drainage may reduce fetomaternal transfusion.^{5, 6} However, one study found no extra benefit from placental cord drainage.⁷

The present study was conducted to assess the effect of placental cord drainage on the duration of third stage labor. The secondary objective was to clarify the safety of this method regarding postpartum hemorrhage, retained placenta, incidence of manual removal of placenta, and the need for blood transfusion.

Objective:

To assess the effect of placental cord drainage on the duration of third stage of labor, and to assess the safety of this method regarding risk of postpartum hemorrhage, retained placenta, incidence of manual removal of placenta, and the need for blood transfusion.

MATERIALS AND METHODS

Study design and setting

It was a randomized controlled trial conducted in Gynae unit 4, Sir Ganga Ram hospital/ FJMC Lahore throughout the period between Jan –July 2011.

Methodology

Inclusion criteria

- Uncomplicated full term singleton pregnancy with vertex presentation.
- Patients expected to have spontaneous vaginal delivery.
- Multipara less than 4.

Exclusion criteria

- Induced labour
- Previous history of PPH
- Hemoglobin less than 10 g/dl
- Ante partum hemorrhage
- Multiple pregnancies

- Instrumental delivery
- Known coagulation disorder
- Over distended uterus (hydramnios. Large fetus).

200 women were included in study. After taking a detailed history and performing general physical and obstetric examination, informed consent was taken from those who fulfilled the inclusion criteria. Once the women delivered vaginally they were divided into two groups (study and control).

In the control group (n=100), inj oxytocin 10 units was given I/v at delivery of anterior shoulder. After delivery of baby the cord was left clamped and the signs of placental separation were assessed. When there were signs of placental separation, the placenta was delivered by Brandt-Andrew maneuver. In study group (n=100), inj oxytocin 10 units was given I/v at delivery of anterior shoulder. After delivery of baby, the cord was clamped and cut. The placental side of cord was unclamped and free release of the blood was allowed into the container until flow ceased. The cord was then re-clamped and the placenta was delivered by Brandt-Andrew maneuver. Signs of placental separation were as follows⁸: **1.** The uterus became globular and firmer, **2.** There was a sudden gush of blood, **3.** The umbilical cord protruded farther out of the vagina.

The duration of 3rd stage was calculated using a stopwatch. A retained placenta was diagnosed if the time of third stage was more than 30 minutes, and the placenta was delivered by manual removal. Blood was collected in a kidney tray and measured. Care was taken not to mix the drained blood from the cord with the blood lost during the third stage. Postpartum hemorrhage was defined as blood loss over 500 milliliters.

Outcome measures

The **primary outcome measures** were the duration of 3rd stage of labour and the amount of blood loss.

Secondary outcome measures were the incidence of retained placenta, manual removal of placenta, postpartum hemorrhage and need for blood transfusion. Data was recorded on a Performa and T-test was used for statistical analysis.

RESULTS

Both study and control groups were comparable regarding their age, parity and gestational age. Table (1).

Table 1: demographic criteria of study and control groups

	Study group (n = 100)	Control group (n = 100)	P value
Age (years)	25.1 + 5.4	26.2 + 5.8	0.32
Gest age(wks)	38.5 + 1.2	38.4 + 1.2	0.53
Parity n (%)	51 (51)	64(64)	0.20
0			
1-4	49 (49)	36(36)	0.26

The average duration of 3rd stage of labour was 5.02 ± 1.71minutes in study group and 7.42 ± 2.56 minutes in control group. This difference was highly significant (p< 0.001). The average 3rd stage blood loss was 175.05 ± 118.15 ml in the study group and 252.05 ± 145.48 mL in the control group. This difference was highly significant

(p<0.001). There were two cases of retained placenta that required manual removal in the control group, no such cases reported in the study group. One case of postpartum hemorrhage due to inertia was reported in control group and required blood transfusion. No reported cases of postpartum hemorrhage in the study group.

Table 2: The outcome of the study

	Study group (n = 100)	Control group (n = 100)	p-value
3rd stage (minutes)	5.02 ± 1.71	7.42 ± 2.56	<0.001
Blood loss (ml)	175.05 ± 118.15 ml	252.05 ± 145.48 mL	<0.001
Retained placenta (no.)	0	2	0.1
Manual removal of placenta(no.)	0	2	0.15
Postpartum hemorrhage(no.)	0	1	0.31
Blood transfusion(no.)	0	1	0.31

DISCUSSION

The third stage of labour begins immediately after birth of the baby and ends with the expulsion of the placenta and fetal membranes. Following delivery of the fetus, uterine contractions continue and the placenta is sheared from the underlying endometrium. This separation primarily occurs by a reduction in the surface area of the placental site as the uterus shrinks. This decrease is caused by myometrial retraction, which is a unique characteristic of the uterine muscle to maintain its shortened length following each successive contraction. In this way, the placenta is

undermined, detached, and propelled into the lower uterine segment. The second mechanism of separation is through hematoma formation due to venous occlusion and vascular rupture in the placental bed caused by uterine contractions.⁹ Placental delivery is essential to allow the uterus to contract and thus reduce blood loss in the third stage of labour. This process is completed within 5 minutes in 50% of deliveries and by 15 minutes in 90%. Failure of the placenta to be delivered in such a timely manner is a well-known risk factor of PPH.^{10, 11}

Two different approaches have been used to deal with third stage labour: "active management"

and "physiological or expectant management". Placental cord drainage has been proposed as a variation of one of the components of the active management. Drainage of cord blood has been proposed to assist with delivery of the placenta.

The mean age, gestational age and parity were comparable in both groups in our study which is as found in other studies.¹²

A 2005 Cochrane review included only 2 studies addressing this intervention, which makes it difficult to draw conclusions. The selection criteria for the review were low-risk vaginal deliveries in which a cord clamped within 30 seconds of delivery and separated was unclamped, which allowed the blood from the placenta to drain freely. The measured outcomes included incidence of retained placenta (at 30 to 45 minutes), manual removal of the placenta, PPH, length of the third stage of labour, need for blood transfusion, decrease in maternal hemoglobin level, and maternal pain. The outcomes reported were a decreased incidence of retained placenta at 30 minutes (RR 0.28; 95% CI 0.10 to 0.73) and a shorter third stage (weighted mean difference – 5.46; 95% CI –8.02 to –2.90) after cord drainage.⁴

Some what similar results were obtained in our study showing average duration of 3rd stage of labour 5.02±1.71minutes in study group and 7.42±2.56 minutes in control group having significant difference (p< 0.001). The average 3rd stage blood loss was significantly more in control group as compared to study group (p<0.001). There were two cases of retained placenta that required manual removal in the control group, no such cases reported in the study group. One case of postpartum hemorrhage due to inertia was reported in control group and required blood transfusion as compared to study group in which no PPH or blood transfusion was observed.

Sharma et al. randomly assigned 958 women to either placental cord drainage or controlled traction after administration of 0.2 mg of ergonovine with delivery of the anterior shoulder and immediate cord clamping. Measured outcomes were PPH and length of the third stage. The third stage had a mean duration of 3.24 and 3.20 minutes in the drainage group versus 8.57 and 6.20 minutes in the traction group in primigravid (P < 0.05) and multigravid (P < 0.05) women, respectively. There was no significant difference between the groups in the incidence of blood loss > 500 mL and the need for transfusion (P > 0.05), and none of the women had a retained

placenta.¹³ The limited number of studies makes it difficult to recommend a change in practice to support routine cord drainage, but this intervention does appear to reduce the length of the third stage of labour and the risk of a retained placenta. More research is required to determine if the length of the third stage is reduced with routine drainage after the use of uterotonics and if this intervention reduces the risk of PPH.

Giachalone reported a randomized study comparing 239 women who had placental cord drainage with 238 women with expectant delivery of the placenta. The median value of duration of third stage of labour was 8 minutes in cord drainage group and 15 minutes in the control group⁵. Gulati et al studied 200 pregnant women to evaluate placental blood drainage during vaginal delivery as a method of shortening the duration of third stage and reducing the amount of blood loss and concluded that duration of third stage of labour in the control group was 5.72 minutes and in the study group it was 2.94 minutes Amount of blood lost in the third stage of labour was 247.59 ml in the control group and 193.63 ml in the study group. Incidence of postpartum hemorrhage was 12% in the control group and 6% in the study group. Retained placenta was observed in 4% in the control group and in 0% in the study group.¹⁴

Three studies involving 1257 women met our inclusion criteria. Cord drainage reduced the length of the third stage of labor and the average amount of blood loss. The differences between the cord drainage and the control group were not statistically significant for postpartum hemorrhage or manual removal of the placenta. None of the included studies reported fetomaternal transfusion outcomes and there were no data relating to maternal pain or discomfort during the third stage of labour.¹⁵

According to another study the third stage of labor was significantly shorter after placental cord drainage (5.1 +/- 2.4 minutes vs. 7.0 +/- 6.1 minutes). There was no postpartum hemorrhage, uterine atony, hypovolemic shock, or the need for blood transfusion in neither groups.⁵

CONCLUSION

Placental cord drainage shortens the duration of third stage of labour. This method appears to be safe and does not increase postpartum complication. Further investigation of the effect of cord drainage on the maternal and neonatal outcome is needed.

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