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Effect of Placental Cord Drainage on the Third Stage of Labor

MU. Alamelu Varsha[1], S. A Deshpande[2]

[1]Junior Resident II, Department of Obstetrics and Gynecology, Bharati Vidyapeeth (Deemed to be University) Medical College & Hospital, Sangli

[2]Professor, Department of Obstetrics and Gynecology, Bharati Vidyapeeth (Deemed to be University) Medical College & Hospital, Sangli.
[2]Corresponding Author Email: *alameluvarsha96[at]gmail.com*

Abstract: ***Placental cord drainage is unclamping the maternal side of the umbilical cord, thereby permitting the blood from the placenta to drain freely into a vessel immediately after the clamping and cutting of the umbilical cord. The aim was to study observe the Effects of Placental Cord Drainage on the third stage of labor progress. This study was an observational study carried out in the department of Obstetrics and Gynecology, who undergo spontaneous vaginal delivery over a period of six months were included in the study. This study population have been divided into two groups. In Group 1 (30 women-unclamped), Group 2 (30 women-clamped). The amount of blood loss and the time duration taken for the separation of placenta was noted in both groups. The mean duration of the third stage of labour was 6.36 ± 1.47 mins in Group 1 and 25.30 ± 4.98 mins in Group 2. The average amount of blood loss was 191.53 ± 37.51 ml in Group 1 and 359.63 ± 61.11 ml in Group 2. There was no retained placenta in the study. One patient in Group 2 had PPH. None of the women required blood transfusion. Placental cord drainage is simple, safe and non-invasive method.***

Keywords: Placental cord drainage, Postpartum hemorrhage

1. Introduction

The third stage of labor is defined as the period from the birth of the baby to the expulsion of the placenta. Management of the third stage is related to the obstetric complications and maternal prognosis. Although, it is the shortest stage of labor where it ranges from 5 to 30 mins, yet it is potentially the riskiest stage of labor. Delivery of placenta is associated with blood loss. The amount of blood loss depends on the time taken by the placenta to separate from uterine wall and on the effectiveness of the uterine contractions. Post-partum hemorrhage is most common complication of this stage. Post-partum hemorrhage is the most common cause of maternal mortality and contributes to about 25 % of all maternal deaths. Primary postpartum hemorrhage that refers to an excessive blood loss of 500 ml within 24 hours of delivery. Other complications are uterine atony, retained placenta, hemorrhagic shock. Active management consists of measures to reduce the duration of the third stage of labor and the blood loss that occurs during this stage. Active management and expectant management are regarded as two different approaches to the clinical management of the third stage of labor. Active management of the third stage of laborconsists of three steps, namely, intramuscular administration of 10 units of oxytocin immediately after delivery of anterior shoulder, placenta was delivered by controlled cord traction technique; following by uterine massage. Expectant management primarily includes maternal efforts supported by gravity, nipple stimulation, increasing maternal oxytocin concentration and strengthening the uterine contractions that will assist the placental separationand control bleeding. Placental cord drainage has been suggested as a way of minimizing the impact of cord clamping on the third stage of labor for mothers. Placental cord drainage is defined as the unclamping the maternal side of the umbilical cord, thereby permitting the blood from the placenta to drain freely into a vessel immediately after the clamping and cutting of the umbilical cord. It is physiologically plausible that draining blood from the placenta would reduce its bulkiness allowing the uterus to contract and retract effectively leading to the delivery of placenta and may reduce the duration of the third stage of labor.

Aim

The aim of this study was to observe the Effects of Placental Cord Drainage (PCD) on the third stage of labor progress.

Objectives

- To compare the amount of blood loss during the third stage of labor in both groups. (Group 1 – Unclamped, Group 2 – Clamped)
- To compare the time duration taken for the separation of placenta in the third stage of labour in both groups. (Group 1 – Unclamped, Group 2 – Clamped)

2. Materials and Methods

This study was an observational study carried out in the department of Obstetrics and Gynecology, Participants who undergoes vaginal delivery in the labor room. Participants have been selected alternatively in Group 1 and Group 2. The inclusion criteria were singleton pregnancy, term pregnancy (Gestational age 37-41 weeks), vertex presentation, viable fetus, Estimated fetal weight by ultrasound (2 kg – 3.5 kg). The exclusion criteria were participants whose hemoglobin is less than 8g/dL, Parity more than four, Over distended uterus (Polyhydramnios, Multiple pregnancy and large baby), If obstetrics and medical complication (Antepartumhemorrhage, Hypertensive disorders, Gestational diabetes, Premature rupture of membrane, Coagulation disorders), previous surgeries on the uterus, instrumental delivery, fetal compromise or anomaly, uterine malformation. Basic data have been collected from the participants. It consists of two

parts; the participants socio-demographic data was the first part of the schedule that entails age, occupation, level of education; while the Obstetric history includes gravidity parity and gestational age and the initial assessment data includes; the general assessment findings such as vital sign, body weight, height, blood investigations results as hemoglobin level, Rh factor, Platelet Count, Bleeding time, Clotting time, Aptt, PT, INR, abdominal examination findings (i. e. fundal height, fetal presentation and position and fetal heart rate) vaginal examination findings with the Bishop score at the time of labour room attendance, and the findings of abdominal ultrasound scanning was included; in order to identify the eligibility to the study. Participants who voluntarily agree to participate in the study have been involved and the written consent was taken from those who fulfilled the inclusion criteria. Low-risk pregnancy womenhave been taken as participants. Once, the women delivered vaginally, they were divided into two groups (Group 1 and Group 2). In Group 1, the maternal side of umbilical cord was unclamped immediately after it was cut and left open to drain blood in a vessel until flow ceases. This prevented the drained blood from getting mixed with the blood lost in the third stage. In Group 2, the maternal side of umbilical cord wasremained clamped. In Group 1, if bleeding does not cease within 15 minutes of unclamping the umbilical cord, then we reclamped the maternal side of umbilical cord and these participants were not involved in this study. Both groups received the same conventional hospital care for managing the third stage of labor, while the Group 1 had additionally exposed to placental cord drainage. Routine prophylactic oxytocin for AMTSL was administrated in both the groups. The duration of the third stage of labor was measured from birth of the neonate until delivery of placenta, calculated using stop watch. The amount of blood loss was measured approximately with the help of an absorbable molly sheet, sponges, mops and vaginal pads. Rupture of membranes, the liquor was allowed to drain in a separate measuring jar. Weight of all blood-soaked materials and clots used to determine cumulative volume, 1 gram weight = 1 milliliter blood loss. The blood loss of blood-soaked items had been calculated in the following way, wet item (gram weight)-dry item (gram weight) = milliliters of blood within the items. Blood from episiotomy wound or perineal tear were mopped and the mops were discarded. Once the sign of placental separation appearthe cord was reclamped and the placenta was delivered by controlled cord traction (Brandt – Andrewsmaneuver). If there was excessive bleeding due to uterine atony in 500 ml of saline drip containing 10 units oxytocin was started. If the uterus still did not contract adequately Prostodin (PGF 2α) 250 mg was given intramuscularly. Once the uterus was well contracted and active bleeding had stopped, remaining blood in the vagina was removed and sterile vaginal pads were given. Care was taken not to mix the drained blood from the cord with the blood lost during the third stage. The weighing machine was used to measure the placental weight.

The pulse rate, blood pressure and tone of the uterus were noted immediately after delivery. The women were kept under observation for 24 hours for any complication. Blood transfusion was given whenever blood loss was more than 1000 ml or if indicated by the clinical status of the patient. Hb gm% was measured after 48 hours of delivery in both the groups and difference from the antenatal value was observed.

The duration of the third stage of labor and the amount of blood loss were the primary outcome measures, whereas the incidence of postpartum hemorrhage, retained placenta and the need for blood transfusion were the secondary outcome measures. Microsoft Excel and SPSS-22 were used for statistical analysis. Mean, standard deviation, standard error of mean was calculated and unpaired t – test was used to compare different variables like age, parity, gestational age, neonatal weight, duration of third stage of labor, gestational age and neonatal weight for statistical analysis. P value <0.05 was taken as significant. Paired t test was used to compare pre delivery and post delivery for levels of hemoglobin.

3. Results

As seen in Table 1 the two groups were well matched with respect to demographic variables. There is no statistically significant difference in mean age, gravida, gestational age and neonatal weight in Group 1 (unclamped) and Group 2 (clamped). The table 2 shows the outcome of the study mean duration of the third stage was 6.36 ± 1.47 minutes in the Group 1 (unclamped) and 25.30 ± 4.98 in theGroup2 (clamped). There is statistically significant difference in mean duration (in minutes) of Group 1andGroup 2, in which Group 2 patients have significantly larger duration than Group 1 (unclamped). The average amount of blood loss was 191.53 ± 37.51 ml in the Group 1 and 359.63 ± 61.11 in the Group 2 (clamped). There is statistically significant difference in mean amount of blood loss in Group 1 and Group 2. All patient in both groups have lost the blood < 500 ml. The mean placental weight was 253.67 ± 29.01 in Group 1 (unclamped) and 420.53 ± 49.68 in Group 2 (clamped). There is statistically significant difference in mean placental weight of Group 1 and Group 2. All patient in both groups have placental weight < 500 grams. On comparing the mean of pre delivery hemoglobin and post-delivery hemoglobin levels was 0.5067 in Group 1 (unclamped) and 0.93 in Group 2 (clamped). There is statistically significant decrease in difference of haemoglobin levels in Group 1. There was no retained placenta in the study. There was onecase of postpartum haemorrhage in the Group 2 (clamped). None of the women required blood transfusion. There was no case of PPH in the Group1 (unclamped).

Table 1: Demographic variables (Mean ± SD)

Parameters	Group 1 (Unclamped) N (30)	Group 2 (Clamped) N (30)	t value	P value
Duration of third stage of labor (minutes)	6.36 ± 1.47	12.56 ± 1.86	14.327	0.00
Amount of blood loss (milliliter)	191.53 ± 37.51	359.63±61.11	12.841	0.00
Placental weight	253.67 ± 29.01	420.53 ± 49.68	15.887	0.00

Table 2: Outcome of the study (Mean ± SD)

Parameters	Group 1 (Unclamped) N (30)	Group 2 (Clamped) N (30)	t value	P value
Age (years)	24.63 ± 4.50	25.30 ± 4.98	0.544	0.589
Parity	1.57 ± 0.73	1.60 ± 0.72	0.178	0.859
Gestational age (weeks)	38.72 ± 1.14	38.65 ± 1.08	-0.267	0.790
Neonatal weight (kilogram)	2.90 ± 0.26	2.90 ± 0.29	-0.047	0.963

Table 3: Comparing Pre-delivery Hb levels and Post-delivery Hb levels (Mean ± SD)

Parameters	Group 1 (Unclamped) N (30)	Group 2 (Clamped) N (30)	t value	P value
Hb difference	0.5067 ± 0.14	0.93 ± 0.37	5.834	0.00

4. Discussion

The third stage of labour begins immediately after the birth of the baby and ends with the ends with the expulsion of the placenta and membranes. It is preceded by a sudden reduction in uterine size and concurrent contraction and retraction of the uterus. Reduced uterine size, limited placental elasticity and tight compression by the uterus lead to separation of the placenta from spongy decidua. This study focused on assessing the effect of draining the umbilical cord on the outcome of placental delivery during the third stage of labor among parturient mothers in a hospital.

The present study findings is supported by a study done by Razmkhah (1999) he first reported that duration of third stage of labor was significantly shorter when using the placental cord drainage method. A study was also done by F Dickinson, I Symonds (2005) to evaluate the effect of placental cord drainage on the third stage of labor, with or without prophylactic administration of oxytocic. The results showed that cord drainage reduced the length of the third stage of labor, the mean difference was about 2.85 mins. The Cochrane data base of systemic review studied the effect of placental cord drainage on the 3rd stage of labor and concluded that cord drainage resulted in statistically significant reduction in the length of 3rd stage of labor [1]

Another study done earlier by Giacalone, and he reported a randomized study comparing 239 women who had placental cord drainage with 238 women with expectant delivery of placenta. The median value was 8 mins in cord drainage group and 15 mins in the control group [2].

A study done by Gulatei et al the results showed shortening of the third stage duration which is 2.94 mins in Group 1 and 5.72 mins in Group 2, and reduction of the amount of blood loss was 193.63 ml in Group 1 and 247.59 ml in Group 2. Retained products were observed (0%) in Group 1 and (4%) in Group 2. The incidence of PPH was (6%) in Group 1 and (12%) in Group 2 [3].

A study done by Sharma et al reported a study on 958 women having vaginal delivery, who were randomized to the drainage method (478 women) or controlled cord traction method (480 women) for placental delivery. The mean duration of third stage of labor was 3.24 minutes and 3.2 minutes in the placental drainage group in contrast to 8.57 min and 6.2 min in controlled cord traction method in primigravida and multigravida respectively [4]. ShravageJ and Silpa P in their study found that the duration of 3rd stage was 5 minutes in the study group and 7.4 minutes in control group. The average blood loss was 175 ml in the study group and 252 ml in the control group [5]

In our study the mean duration of the third stage was 6.36 ± 1.47 minutes in the Group 1 (unclamped) and 25.30 ± 4.98 in the Group 2 (clamped). The average amount of blood loss was 191.53 ± 37.51 ml in the Group 1 (unclamped) and 359.63 ± 61.11 in the Group 2 (clamped). There was no retained placenta was reported in this study. One patient in the Group 2 (clamped) had postpartum haemorrhage. None of the women required blood transfusion.

5. Conclusion

Placental blood drainage as part of active management of third stage of labor was effective in reducing the duration, the blood loss and also the incidence of PPH. Placental cord drainage is simple, safe and non-invasive method of great use in day-to-day obstetric practice that does not require any extra efforts, cost or equipment. It may be especially relevant in facilities with poor infrastructure.

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