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Original Research Article

Effect of placental cord drainage on third stage of labour and in prevention of postpartum hemorrhage: randomized control trial at tertiary care centre

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ABSTRACT

Background: Postpartum hemorrhage is the leading cause associated with 25% of maternal mortality. Prolonged duration of third stage of labour accounts for postpartum hemorrhage. The new trend in third stage management is placenta cord drainage (PCD). The physiology of PCD is decrease in bulkiness of placenta which consequently increases the uterine contractility. Effective uterine contraction mostly shortens third stage duration and decrease the risk for PPH

Methods: This study is a randomized control trial in which full term pregnant women admitted in labour unit at Sri Devaraj Urs medical college and research centre, Kolar, Karnataka. Total 80 women were included in this study. They were divided into two groups, control group and study group with n=40 in each group. Placental cord drainage was done in the study group. In the Group 1 placental end of the cut umbilical cord remained clamped. In the Group 2, the placental end of the cut umbilical cord unclamped immediately and collected in a vessel till the flow ceased. Thus, the drained blood was prevented from getting mixed with blood lost in the third stage. Blood lost in the third stage was collected in a clean drape sheet. Placenta was delivered by controlled cord traction after the signs of placental separation were seen. The duration of third stage was calculated using a stopwatch.

Results: In our study, the mean duration of third stage of labour in control group was 6.58minute and in study group was 2.28 minutes. Significant statistical difference was found in duration of third stage of labour.

Conclusions: PCD is noninvasive and safe intervention during third stage of labour and effective in reduction of incidence of postpartum hemorrhage.

Keywords: Placental cord drainage, Duration of third stage of labour, PPH

INTRODUCTION

Pregnancy is physiological process which is often associated with maternal mortality and morbidity.[1] Postpartum hemorrhage is the leading cause associated with 25% of maternal mortality. Prolonged duration of third stage of labour accounts for postpartum hemorrhage. The third stage of labour starts after expulsion of foetus and ends by complete expulsion of placenta. The prolongation of third stage leads to enhanced probability of severe maternal complications and death. The complications include uterine atony, placental retention, postpartum hemorrhage (PPH), hemorrhagic shock, and even maternal death.[2] The chief cause of PPH is uterine atony. Effective uterine contraction after placental expulsion to stop bleeding are key elements to prevent complications of third stage. Factors for expulsion of placenta are separation from uterine wall, capillary hemorrhage, uterine muscle contractility, maternal effort, and effect of gravity on the

placenta. Placental delivery is usually completed within 15 minutes following the fetus delivery in 90% of patients. Management of the third stage of labour consists of two distinct methods. They are active and physiological/expectant management. The active management includes administration of oxytocin, controlled cord traction and umbilical cord clamping.[4] The physiological management includes maternal effort, nipple stimulation through breast feeding and skin-to-skin contact rapidly after birth, gravity that will help in the placental separation and bleeding control .Nipple stimulation increases maternal oxytocin concentrations and strengthen the uterine contractions.[5] After the placenta separation, it is delivered through controlled cord traction. The new trend in 3rd stage management is placenta cord drainage (PCD). After clamping the umbilical cord immediately after foetus delivery, placental blood drainage is done by declamping the cord from maternal side.[7] The hypothesis behind this technique is that low weight of the placenta may facilitate its quick delivery. The physiology of PCD is decrease in placental bulkiness which consequently increases the uterine contractility. Effective uterine contraction mostly shorten third stage duration and decrease the risk for PPH.[11]

Aim and objective

This study aims to investigate the effect of placental cord drainage (PCD) on the duration of third stage of labour and incidence of postpartum hemorrhage.

METHODS

Study design, location and duration

This study is a randomized control trial in which full term pregnant women admitted in labour unit at our tertiary care centre for normal delivery were evaluated. Current study was conducted at RL Jalappa tertiary care centre, Kolar from October 2021 to January 2022.

Inclusion criteria

Inclusion criteria for current study were; age between 18 to 35 years & gestational age between 37-40 weeks, singleton pregnancy, clinically adequate pelvis, cephalopelvic disproportion ruled out, subjects included were non-smokers, non-alcoholic and vertex presentation.

Exclusion criteria

Exclusion criteria for current study were; multiple gestation, preterm gestation and manual removal of placenta.

Procedure

Total 80 women were included in this study. They were divided into two groups, control group and study group with n=40 in each group to detect 1 minute difference between study group and control group with 5% alpha error and power of 80%. After admission to labour unit, a detailed history of all the participants were taken. General and obstetric examination were evaluated and gestational age, fetal presentation and status of labour at the time of admission were assessed. Baseline investigations were done. After taking consent, once the women delivered vaginally, they are randomized into 2 groups (control and study groups) through blind envelope method. Control cases were included in Group 1 (N=40) and Study cases were included in Group 2 (N=40). In the Group 1 placental end of the cut umbilical cord remained clamped. In the Group 2, the placental end of the cut umbilical cord unclamped immediately and collected in a vessel till the flow ceased. Thus, the drained blood was prevented from getting mixed with blood lost in the third stage. Blood lost in the third stage was collected in a clean drape sheet. Placenta was delivered by controlled cord traction after the signs of placental separation were seen. The duration of third stage was calculated using a stopwatch. The blood collected in the drape sheet was discarded after assessing blood loss. The pulse rate, blood pressure and state of the uterus noted immediately after delivery. Blood transfusion was suggested in required cases. The women were observed for any complications for the next one hour. The duration of third stage of labour, incidence of postpartum hemorrhage and requirement of blood transfusion were noted. Data collected was entered in Microsoft Excel Spread Sheet and the results were analysed.

RESULTS

The total participants were divided into 2 groups; Group 1 included control cases and Group 2 included study cases. Age criteria were divided into 2 categories 18-25 years and 26-35 years.70% of women were in first category. Majority of the women in the study were primigravida accounting for 47.5%. In this study, the mean duration of third stage of labour in control group was 6.58minute and in study group was 2.28 minute. Significant difference was found in duration of third stage of labour ($p<0.001$).

In this study, incidence of postpartum hemorrhage was 10% in control group and in study group it was 2.5%. In this study, blood transfusion was required for 5% in control group and no requirement of blood transfusion in study group.

Table 1: Age of the participants.

Age (years)		Group		Total
		Control	Study	
18-25	N	27	29	56
	%	67.5	72.5	70
26-35	N	13	11	24
	%	32.5	27.5	30
Total	N	40	40	80
	% within GR	100	100	100

Table 2: Gestational age of participants.

Gravida		Group		Total
		Control	Study	
G2A1	N	1	4	5
	%	2.5	10.0	6.2
G2P1L1	N	13	10	23
	%	32.5	25.0	28.7
G3A2	N	1	0	1
	%	2.5	0.0	1.2
G3P1L1A1	N	3	2	5
	%	7.5	5.0	6.2
G3P2L2	N	1	5	6
	%	2.5	12.5	7.5
G4P1L0A2	N	1	0	1
	%	2.5	0.0	1.2
G4P2L2A1	N	1	0	1
	%	2.5	0.0	1.2
PRIMI	N	19	19	38
	%	47.5	47.5	47.5
Total	N	40	40	80
	%	100	100	100

Table 3: Duration of third stage of labour.

Duration	N	Mean	SD	SEM
Control	40	6.58	1.375	0.217
Study	40	2.28	0.679	0.107

Table 4: Incidence of PPH

Groups	PPH			Total
		No	Yes	
Control	N	36	4	40
	%	48.0	80	50
Study	N	39	1	40
	%	52.0	20	50
Total	N	75	5	80
	%	100	100	100

Table 5: Need for blood transfusion.

Groups	BT			Total
		No	Yes	
Control	N	38	2	40
	%	48.7	100	50
Study	N	40	0	40
	%	51.3	0	50
Total	N	78	2	80
	%	100	100	100

DISCUSSION

The prolongation of third stage leads to enhanced probability of severe maternal complications and death. The delivery of the placenta is essential for uterus to contract and decrease in blood loss. Placental cord drainage reduces the placental volume and surface area which cause decrease in bulkiness of placenta and allow the uterus to contract effectively which leads to decrease in postpartum hemorrhage.

This is a new way of management of third stage of labour approved by WHO. Present study conclude that there was no statistical difference in mean age group between control and study groups which was similar to the study conducted by Chaudhary et al. Majority of women were primigravidae in both control and study groups and there was no major difference in their association. In our study, the mean duration of third stage of labour in control group was 6.58 minute and in study group was 2.28 minutes. Significant statistical difference was found in duration of third stage of labour ($p<0.001$). Chaudhary et al in their study concluded that there was significant difference in duration of third stage of labour between control and study groups.[17] In this study, incidence of postpartum hemorrhage was 10% in control group and in study group it was 2.5% which was not statistically significant but difference was considered for prevention of postpartum hemorrhage.

Afzal et al in their study concluded that mean blood loss in PCD group was statistically lowered when compared to control group.[18] In our study, Blood transfusion was required for 5% in control group and no requirement of blood transfusion in study group. Meena and Devika in their study reported that the need for blood transfusion was decreased in placental cord drainage.[19] The present study revealed no statistical difference in need for blood transfusion.

Strengths and limitations

The strength of the study was inclusion of multigravidae in both control and study groups**.** The limitation of the study was small sample size. Evaluation for incidence of postpartum hemorrhage and further requirement of blood transfusion to be done in studies with large sample size.

CONCLUSION

Our study reports show statistically significant difference in duration of third stage of labour which is crucial factor to decrease incidence of postpartum hemorrhage. Although there was no statistically significant difference in incidence of postpartum hemorrhage and blood transfusion requirements between control and study groups, placental cord drainage helps in prevention of large amount of blood loss. There was no difference in the stability of vitals of participants before and after delivery. Hence PCD is noninvasive and safe intervention during third stage of labour and effective in reduction of incidence of postpartum hemorrhage.

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