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ORIGINAL ARTICLE

Effect of Placental Cord Blood Drainage on Duration of Third Stage of Labour

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ABSTRACT

Objective: Current study was conducted to explore placental drainage effect on the 3rd stage of labour.

Methodology: This **r**andomized controlled clinical trial was directed at normal labour unit at Sahiwal Medical College using non-probability consecutive sampling technique to enroll 112 patients undergoing normal vaginal delivery.

Results: This study was conducted from 15th March 2021 till 14th September 2021 after approval of hospital ethical committee. In our study total 112 patients were enrolled and divided in two groups. Mean age of 30.98±4.727 years in PCD group and 32.18±3.298 years in control group. Mean gestational age was 39.187±0.8123 in PCD group and 39.148±0.8123 in control group. Mean pre-delivery hemoglobin levels and hematocrit was also comparable in both groups with p-value more than 0.05. Duration of third stage of labor was significantly shorter in PCD group i.e. 8.53±2.7 minutes as compared to control group i.e. 10.7±5.3 minute, p-value was significant 0.001. There was less blood loss in PCD group, p-value 0.039. post-delivery hematocrit was low in control group, p-value 0.021. There was no relation of age, gender and parity on duration of third stage of labour.

Conclusion: Placental Cord Blood Drainage is secure, and effective noninvasive intervention that may help in improving 3rd stage progress.

Keywords: Placenta Cord Drainage, Third Stage of Labour, Postpartum Hemorrhage.

INTRODUCTION

Mortality as well as morbidities are always attached with the physiological process called labour. The most frequent reason of mortality is loss of blood during delivery.[1] The worldwide annual death rate due to postpartum hemorrhage is around 127,000 with the increasing frequency in high income countries. In Pakistan, decrease in maternal morality ratio has been observed from 276 deaths/100,000 live births to 186 deaths/100,000 live births.[2] Maternal mortality ratio of Azad Jammu and Kashmir and Gilgit-Baltistan is 104 and 157 respectively. Whereas, in rural areas, death rate is 199 as compared to urban areas, i-e., 158 which is 26 individuals higher.[4]

This is still very high ratio and need urgent steps to reduce this ratio. The availability of standardized emergency obstetric care is considered the first most important strategy to decrease maternal mortality. Furthermore, One of the targets under Sustainable Development Goal III is to decrease worldwide MMR to lower than 70 per 100 000 births between 2016 and 2030. Hemorrhage (especially intra and post-partum), sepsis and eclampsia are the chief causes of maternal deaths. Furthermore, the preexisting diseases that are triggered by pregnancy play indirect role in increasing maternal mortality.[5]

Duration from delivery to the placental expulsion is called third stage of labour.[2] Placental expulsion causes loss of blood in the delivery course which could be very hazardous as due to more blood-loss as compared to normal amount could result in severe health issues as well as could be death causing. There are numerous reasons for elevated loos of blood but the most commonly observed cause is uterine atony. So, the third stage duration during labour should be minimal to avoid excessive blood loss. For this purpose, actively managing the third stage of labour could minimize the period of 3rd stage, so as the loss of blood.[3]

Placental expulsion depends its separation from uterine wall, capillary hemorrhage, contractility of the uterine muscle, maternal effort, and gravity effect on the placenta. Placenta delivery is generally completed within 15 minutes following the fetus delivery in 90% of parturient. Two distinct methods are usually used to manage the 3rd stage of labor. They are active and physiological/expectant management. The active management includes oxytocic administration, umbilical cord early clamping and cutting, and the controlled cord traction. The physiological or expectant management primarily includes maternal effort supported by gravity, nipple stimulation through breast feeding and skin-to-skin contact rapidly after birth, nipple stimulation increasing maternal oxytocin concentrations and strengthening the uterine contractions that will assist the placental separation and control bleeding.[6] The existing literature has evident that the duration of third stage labour could significantly be reduced by drainage.[7] But little information is available about the placental cord drainage. So, there is a dire need to explore that at 3rd stage of labour, practicing placental cord drainage is effective or not

METHODOLOGY

This randomized control trial was conducted during 15th March 2021 till 14th September 2021 at Department of gynecology and obstetrics, Sahiwal Medical College. Data was collected using Non probability consecutive sampling technique. Sample size was calculated using WHO calculator keeping 95% confidence interval, 80% power of study, duration of third stage of labour 8.5±2.9 min in case group and 10.8 ± 5.4 min in control group.[7] Sample size was 112 patients, 56 patients in each group. Patients with normal pregnancy, aged 20 to 35 years, full term singleton pregnancy, normal first and second stage of labour and agree to participate in the study were included. Women who exposed to any pregnancy or labour (first and second stage) complications were excluded from the study.

This study was conducted after approval of hospital ethical committee and written informed consent of patients after full filing the inclusion and exclusion criteria. The selected participants were assigned randomly to either PCD or control group using randomization block technique. This technique was done manually according the subsequent flowing steps: A list was prepared on the computer that contained numbers from 1 to 112. Two copies were printed from this list. One of the two lists was cut to small pieces. Each piece contained one number from 1 to 112. The papers pieces are rolled up until all numbers become investable then they were put in large ball. The 112 pieces of papers were randomly allocated to six blocks. From each block, 10 pieces of papers were randomly picked to be cases and the

remaining 10 are considered control. Finally, the researchers register in front of each number, in the previously prepared list. This list was used as a guide during data collection process. A total of 56 participants were considered potential cases and 56 participants were considered potential control. The list is saved in closed envelop that is opened immediately at time of data collection.

Demographic data including age residence, occupation and level of education was noted. Obstetrical history including gravidity, parity, gestational age, pre-delivery Hb, pre-delivery HCT, history of postpartum hemorrhage, retained placenta, and previous labour complications were noted. Physical examination was done including weight, height and BMI measurements.

The time of birth was recorded for all the participants while performing vaginal delivery and instantly clamped the cord and cut quickly after delivery. But, clamped cord was left while evaluating the signs of placental separation and delivered placenta in control group. In case group, the cord was clamped and cut which was later unclamped to drain the blood in container till separation signs of placenta. Later on, cord was camped again and delivery of placenta was performed. The time of third stage of labour was recorded in minutes. The time noted was from the birth till placental expulsion and fetal membranes. Oxytocin injection (IV) was given after delivery and uterine message was complete in case as well as control group. 12hours of observation was performed to control complications if occurs. Complications were treated as per the protocol of hospital. Data was recorded in structured Proforma for data entry in SPSS version 22. Mean and standard deviation was calculated for age, gravidity, parity, gestational age, Pre-delivery Hb, and Pre-delivery HCT. Independent sample t test was used to explore difference of two groups in term of age, parity and gestational age.

RESULTS

In our study total 112 patients were enrolled with mean age of 30.98±4.727 years in PCD group and 32.18±3.298 years in control group. Mean gestational age was 39.187±0.8123 in PCD group and 39.148±0.8123 in control group. Mean pre-delivery hemoglobin levels and hematocrit was also comparable in both groups with p-value more than 0.05. Duration of third stage of labor was significantly shorter in PCD group i.e. 8.53±2.7 minutes as compared to control group i.e. 10.7±5.3 minute, p-value was significant 0.001. There was less blood loss in PCD group, p-value 0.039. post-delivery hematocrit was low in control group, p-value 0.021. There was no relation of age, gender and parity on time taken during 3rd stage of labour.

Table 1: Demographic data

Obstetrical history and pre delivery investigations	PCD	Control	t test	Sig.
Age	30.98±4.727	32.18±3.298	0.311	0.123
Gravidity:	2.48±1.490	2.55±1.651	0.232	0.817
Parity	1.467±1.5781	1.517±1.71	0.166	0.868
Gestational age	39.187±0.812	39.148±0.81	0.248	0.805
Pre-delivery Hb	11.103±0.80	11.103±0.74	0.059	0.953
Pre-delivery HCT	32.533±2.18	31.950±2.17	1.483	0.141

Table 2: Major maternal results.

Primary maternal outcomes	Placental cord drainage		Control group		Sig.
	Mean	Std. Deviation	mean	Std. Deviation	
Time taken during 3rd stage of labour (min)	8.53	2.7	10.7	5.3	0.001
Blood loss (ml)	213	49.5	260	54.9	0.039
Postpartum Hematocrit between 24 to 48 hours	33.3	3.4	31.7	5.5	0.021

Table 3: comparison of Duration of Labour with age, parity, and gestational age

Age Group	Labour duration (Mean± Std. Deviation)	t Sig.
20 to 35 year	9.7 ± 3.1 mins	t= .600 p= .617
36 to 50 year	9.9 ± 4.9 mins	
PARITY		
≤3 Parity	9.8 ± 4.5 mins	t=.871 p=.389
>3 Parity	9.1 ± 3.5 mins	
GESTATIONAL AGE		
≤38 weeks	9.1 ± 3.3 mins	t=1.546 p=0.153

DISCUSSION

Labour and child birth is the most central point during pregnancy, as 3rd stage of labour may obscure the normal procedure. It is important to deliver placenta which is the last stage of delivery. The procedure of draining placental cord comprises of clamping of cord and cutting it after delivering the baby but instant unclamping of cord at mother side is important to drain the blood. This may be performed in combination with other procedures, for instance, oxytocin administration, maternal effort etc. Scare evidence were available on this but duration of 3rd stage of labour could minimized by cord drainage method.

The findings of current study revealed a shorter period of 3rd stage was observed in PCD group with decrease blood loss and better hematocrit as compared to control group which are in accordance with the literature. These findings are in the same line with the results of at least five previously mentioned recent studies. Results of a similar study reported concluded that the mean blood loss in PCD group was statistically lower compared to the other group ($p<0.001$).[8] Similarly, in another study, a significant reduction was found in case group in terms of blood loss and postpartum hemorrhage during 3rd stage.[9] Third, Royet al.,[10] that included 200 women who are randomized between PCD versus managing actively group or group who is managing actively only. The findings of the study reported that in PCD group, the loss of blood was less during 3rd stage labour as well as the PPH frequency was low as compared to other 2 groups. Fourth, Al-Jeborry et al., 2010[11] revealed that PCD is easily manageable, secure, and non-invasive procedure in decreasing blood-loss during 3rdstage labour, in this manner, avoiding PPH. Fifth, Shravage and Silpa, 2007,[12] who found that the mean value of loss of blood during PCD was significantly lesser than in control group. Furthermore, PCD reduced PPH incidence to 3% and 10% in case and control group, respectively. Present study results are also supported by two randomized controlled trials. They are Asicioglu et al., 2015[13] and Sreelatha et al., 2013.[14] Both of them shown that in PCD group, average loss of blood and incidence of PPH were significantly reduced. Furthermore, Hofmeyr et al., 2015[15] and Begley et al., 2011[16] investigated PCD effect during the 3rd stage labor, concluded that during 3rd stage labour, PCD significantly reduce blood-loss. In addition, Mithala et al., 2018[17] and Mohamed et al., 2017[18] reported that lower loss of blood in case group as compared to control. They also added, PPH was rare in case group which was nonsignificant. Furthermore, a current meta-analysis consisted of 9 research publications performed on 2653 women concluded that PCD reduced PPH incidence to 3%. This finding is surprising since the same meta-analysis reported no blood-loss reduction.[19] On the contrary, a recent study conducted by Vasconcelos et al., 2018[20] has concluded that PCD showed no impact on lowering blood loss or frequency of PPH throughout the 3rd stage labor.

To conclude, reduction in period of 3rd stage labour was found using Placental cord blood drainage technique. It is cost effective, easy to handle and secure non-invasive procedure which could easily be conducted by midwives in rural settings to manage the duration of 3rd stage labour to reduce the 3rd stage period

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