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Original Research Article

A comparative study of the effectiveness of placental blood drainage versus no placental blood drainage in active management of third stage of labor at a tertiary care hospital

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ABSTRACT

Background: WHO defines postpartum haemorrhage (PPH) as when blood loss is greater than or equal to 500 ml within 24 hours after birth. When blood loss is greater than or equal to 1000 ml within 24 hours, it is called as severe primary postpartum haemorrhage. Placental blood drainage is done by clamping and cutting of umbilical cord after birth of baby followed by unclamping the maternal side of cord so the blood can drain freely into a container.

Methods: 200 patients were studied in current research finding. Study group had 100 patients whose placental blood drainage was done and control group had 100 patients whose placental blood drainage was not done. This study was done to analyze the effectiveness of placental blood drainage in reducing blood loss.

Results: The duration of third stage of labor was 295.70 seconds in study group and 475.20 seconds in control group. The amount of blood loss in study group was 273.76 ml and 294.92 ml in control group. p value was found to be significant. Incidence of PPH in study group was 1% and 8% in control group.

Conclusions: Placental blood drainage was safe and simple. It is a non invasive method very useful to prevent PPH. It reduces the duration of third stage of labor and reduces amount of blood loss.

Keywords: Postpartum haemorrhage, Third stage of labor, Placental blood drainage

INTRODUCTION

Third stage of labor begins with the delivery of baby and ends with expulsion of placenta and membranes. Third stage of labor can be managed actively or conservatively. Postpartum haemorrhage (PPH) is the main cause of maternal mortality in Asia, where most maternal deaths occur.¹ A total of 1,40,000 maternal deaths per year or 1 woman every 4 minutes dies due to postpartum haemorrhage.

WHO defines postpartum haemorrhage as when blood loss is greater than or equal to 500 ml within 24 hours

after birth. When blood loss is greater than or equal to 1000 ml within 24 hours, it is called as severe primary postpartum haemorrhage.¹ In 2003, FIGO approved active management of third stage of labor, active management is done to prevent post partum haemorrhage, so that maternal mortality can be prevented.

After birth of baby, placental blood drainage is done by clamping and cutting of umbilical cord after birth of baby followed by immediately unclamping the maternal side of cord so the blood can be drained freely into a container. Placental blood drainage is a simple, safe and non

invasive method which reduces the duration of blood loss in third stage of labor, thereby preventing PPH.²

Factors that lead to increased incidence of PPH are prolonged labor, multifetal gestation, macrosomia, and anaemia, pre-eclampsia and operative vaginal deliveries. But two-third PPH cases occurred in women with no known risk factors. Hence all women are at risk for postpartum haemorrhage.² To prevent and manage PPH drugs like oxytocin, methergin and carboprost are used, they can decrease the incidence by 40%. In rural areas availability of such medications and facilities are limited.³

It is physiologically known that placental blood drainage would reduce its bulkiness of placenta allowing the uterus to contract and retract effectively leading to separation of the placenta and may reduce the duration of the third stage of labor and amount of blood loss.

Aim and objective

Aim of the current study was to evaluate the effectiveness of placental blood drainage via umbilical cord in reducing blood loss in third stage of labor. Objective of the current study was to study the effect of placental blood drainage in study group in reducing blood loss in third stage of labor compared to control group where placental blood drainage was not done.

METHODS

The study was conducted at obstetrics and gynaecology department of Mahatma Gandhi medical college and hospital, Jaipur in the time period of 6 months from April 2020 to September 2020. Current study is a type of randomized control trial study. 100 patients whose placental blood was drained were compared with other 100 patients of whose placental blood was not drained. This study was done to analyze the effectiveness of placental blood drainage in reducing blood loss, decreasing the duration of blood loss and complications of third stage of labor

The inclusion criteria were all patients with gestational age ≥ 37 weeks with singleton cephalic pregnancy and all those who were expected to have vaginal deliveries with no medical or obstetric complications.

The exclusion criteria were preterm pregnancy, history of APH, instrumental delivery, Hb < 7 gm/dl, multiple pregnancies, malpresentations and polyhydramnios, macrosomia (> 3.5 kg).

Detailed medical and obstetric history was taken from the patient. In each patient, the pre delivery pulse rate, blood pressure and haemoglobin percentage were noted. Labor was monitored carefully using partogram and augmentation was done whenever required.

In the study group, after vaginal delivery, cord is clamped and cut, the cord was unclamped and the blood was drained until it stops. Active management of third stage of labor was done; prophylactic oxytocin was given whereas in control group umbilical cord was not unclamped.

Controlled cord traction was used to deliver placenta in both the groups. Blood lost during third stage was measured using Kelly's pad used during delivery and blood loss was also measured using a disposable measuring vessel. Episiotomy wound blood was mopped and gauge pieces were discarded. In case of postpartum haemorrhage due to atonic uterus, active management should be done. Duration of third stage of labor was calculated. Pulse, blood pressure, temperature, SPO₂ monitored post delivery. Patients were kept under strict observation after delivery for 2 hours, haemoglobin (gm %) was measured after 48 hours in both case and control group and difference from that of antenatal value noted. All the data were evaluated and analyzed statistically. Standard deviation and mean values were calculated and $p < 0.05$ was taken as significant values.

Statistical methods

Statistical analysis was carried out using commercial software SPSS (surgical package for social sciences) version 22. The descriptive measures like mean, median and standard deviation for continuous variables are obtained. Frequencies and percentages were calculated for all categorical variables.

Sample size

Sample size was calculated on basis of previous study on prevalence by Kumar et al.⁴ Sample size was calculated to be 100 per group using the formula mentioned below;

$$N = Z^2 \alpha / 2 \times p \times (1 - p) \div E^2$$

Where, type I error (Z alpha, significance) = 1.96, power 80%, prevalence (p) = 7%, margin of error (E) = 5%.

RESULTS

The two groups were well matched in demographic variables (Table 1). The incidence of postpartum haemorrhage was 1% in study group and 8% in control group (Table 2). The mean blood loss in study group was 273.76 ml and was 294.92 ml in control group. There was statistically significant decrease in the blood loss in the study group, p value was found to be 0.045 (Table 3). The duration (mean) of third stage of labor was 295.70 seconds in the study group and 475.20 seconds in control group, the p value was statistically significant (Table 4). The mean drop in haemoglobin (Hb) % level was 1.01 gm/dl in the study group and 1.32 gm/dl in control group (Table 5). These above differences were both statistically

significant. Outcome of the study was also tabulated and found to be significant (Table 6).

Table 1: Demographic variables (mean±SD).

Variables	Study group	Control group	P value
Age (years)	26.31±4.18	26.25±3.43	0.911*
Gravidity	1.97±0.96	1.70±0.83	0.062*
Parity	0.82±0.73	0.61±0.71	0.100*
Gestational age (weeks)	38.56±0.99	38.40±0.98	0.252*
Hb level (gm/dl)	1.01±0.22	1.32±0.20	p<0.001

*Not significant

Table 2: Incidence of PPH.

PPH	Study group (n=100)	Control group (n=100)
Yes	1	8
No	99	92
P value	0.041 (significant)	

Table 3: Amount of blood loss.

Blood loss (ml)	Study group		Control group	
	N	%	N	%
<100	0	0	0	0
101-200	2	2	0	0
201-300	29	29	30	30
301-400	55	55	54	54
401-500	13	13	8	8
>500	1	1	8	8
Mean blood loss (ml)	273.76	65.35%	294.92	83.67 %

Table 4: Duration of third stage of labor.

Variables	Study group	Control group
Mean (seconds)	295.70	475.20
SD (seconds)	249.28	614.57
P value	<0.001 (significant)	

Table 5: Distribution of cases according to change in Hb before and after delivery.

Change in Hb (g/dl)	Study group (N)	Control group (N)
<1	20	0
1-2	80	100
>2	0	0
P value	<0.002 (significant)	

DISCUSSION

Placental blood drainage is a simple, non invasive cost effective method to reduce blood loss. Current study was done to compare the effectiveness of this technique in reducing amount of blood loss and duration of third stage of labor and to prevent PPH.

Table 6: Outcome of the study (mean±SD).

Parameter	Study group	Control group	P value
Duration of 3 rd stage of labour (min)	295±249.28	475±617.57	<0.001
Amount of blood loss (ml)	273.76±65.35	294.92±83.67	0.045
PPH Incidence (Y/N)	1/99	8/92	0.041

*P value was significant for all parameters.

In current study, duration of third stage of labor in study group was 295.70 seconds and 475.20 seconds in control group. p value was found to be significant <0.001. Roy et al studied that duration of labor in study group was 210.5 seconds and 302.5 seconds in control group.¹ Shrivage et al study stated that mean duration of 3rd stage of labor was 5.02±1.71 minutes in placental cord drainage group compared to 7.42±2.56 minutes in the control group.² Sreelatha et al concluded the average duration of the third stage of labour was 4.14±1.67 minutes in the study group and 7.990±5.77 minutes in the control group.^{3,4} The difference was highly significant (p<0.05). Giacalone et al studied that mean duration of third stage of labor was 8 minutes in study group and 15 minutes during control group.⁵ Gulati et al concluded duration of third stage of labor in control group was 5.72 minutes and in study group was 2.94 minutes.⁶ Nidhi et al studied that the duration of third stage of labour between study and control group was 3.61±0.972 and 8.15±1.71 minutes respectively and found to be significant.⁷ Osman et al studied the third stage of labor was significantly shorter in the cord drainage group which was 3.5±1.9 minutes than in the control group which was 7.7±3.4 minutes.⁸ p value was reported to be <0.001 which was significant. Rashmi et al studied that the duration of the third stage of labour was 9.30±0.001 minutes in the control group and 5.32±0.83 minutes in the study group.⁹ The difference was highly significant (p<0.0001). Sharma and Jongkolsiri et al studied that duration of third stage of labour was 5.1±2.4 minutes in study group and in control group was 7.0±6.1 minutes.^{10,11}

In current study incidence of PPH in control group was 8% and incidence of PPH in study group was 1%. p value was found to be significant. Roy et al stated that incidence of PPH in control group is 9% and incidence of PPH in study group is 1%.¹ Shrivage et al stated that

incidence of PPH in study group was 3% and control group was 10%.² p value was reported to be significant. Sreelatha et al concluded no postpartum haemorrhage in study group and 3 postpartum haemorrhage cases in the control group.³ Giacalone et al studied incidence of PPH in study group was 9.9% and in control group it was only 9.6%.⁵ Gulati et al stated that incidence of PPH in control group was 12% and incidence of PPH in study group was found to be 6%.⁶ Osman et al studied that incidence of PPH in control group was 9.4% and incidence of PPH in study group was 3.7%.⁸ Rashmi et al studied that there was no case in study group and incidence of PPH in control group was 2%.⁹ It was reported to be significant. Sharma et al studied that incidence of PPH in case group was 7.5% and incidence of PPH was 8.5% in control group.¹⁰ Jongkolsiri et al studied and found no PPH cases in both groups.¹¹

In current study, amount of blood loss in third stage of labor was 273.76 ml in study group and amount of blood loss in third stage of labor was 294.9 ml in control group. p value found to be significant which 0.045 was. Priyankur et al stated that average blood loss in 3rd stage of labor is 227.5 ml in study group and the amount of blood loss in third stage of labor was 313.3 ml in control group.¹ Shrivage et al stated that average blood loss in 3rd stage of labor was 175±118.15 ml in study group and control group average blood loss in 3rd stage of labor was 252.05±145.48 ml. p value was reported to be significant.² Sreelatha et al stated that the average amount of blood loss was 209±56.07 ml in the study group and 241.27±94.70 ml in the control group.³ Nidhi et al stated that the mean blood loss in study group was 168.14±76.703 ml and control group was 287.40±85.808 ml.⁷ Osman et al studied that the mean estimated blood loss was significantly lower in the cord drainage group than in the control group (207.04±123.3 vs. 277.63±246.9 ml, respectively; p<0.001).⁸ Rashmi et al studied that the mean blood loss in the third stage was 210.6±14.39 ml in the study group and 259.2±11.22 ml in the control group. The difference was highly significant (p<0.0001).⁹

Limitations of the study

Limitations of current study were, the amount of blood loss was measured carefully but due to presence of amniotic fluid and spillage of blood on drapes and gowns it lead to inaccuracies during measurement. That error must be random so that power is reduced but bias of the results.

CONCLUSION

Placental blood drainage is safe, simple and patient friendly. It is a non invasive method very useful to prevent PPH, to decrease the duration of third stage of labor and reduce amount of blood loss. It is doesn't

require any extra effort and is cost effective. This method can be used both in tertiary care centres as well as in rural setup.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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