

Placental Cord Drainage versus no Placental Drainage in the Management of Third Stage of Labour: Randomized controlled trial

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Abstract

Back ground:the third stage of labour begins immediately after the birth of the baby and ends with the expulsion of the placenta and fetal membranes.It is preceded by contraction and retraction of the uterus to reduce uterine size and expel the placenta with minimal haemorrhage. Placental cord drainage involves clamping and cutting of the umbilical cord after the birth of a baby and then, immediately unclamping the maternal side of the cord so the blood can drain freely into a container.

Aim of the work:the aim of this study is to assess the effect of placental cord drainage during active management of the third stage of labour on reducing both blood loss and the length of the third stage.

Materials and Methods:a randomized controlled trial was carried out on 180 patients who underwent vaginal delivery at Ain Shams University Maternity Hospital labour ward.Population of this study were randomly assigned to either:**Group A:** 90 patients was the study group(cord drainage).**Group B:** 90 patients was the control group(no cord drainage). Moreover,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 compared.

Results:the duration and amount of blood loss of third stage of labour was significantly lower in study group than control group.Furthermore,the Postoperative pulse rate,Systolic Blood Pressure, Diastolic Blood Pressure,Hemoglobin and hematocrit value were significantly higher in study group than control group. The retained placenta (manual removal),Postpartum hemorrhageand Blood transfusion were non-significantly less frequent among study group than among control group.

Conclusion:active management of the third stage of labour with the cord drainage method significantly reduced postpartum hemorrhage and the duration of the third stage.

Key Words:Placental cord, Third stage, Postpartum hemorrhage,Labour, Drainage.

Introduction

The 3rd stage of labour refers to the interval from delivery of the fetus to the separation and expulsion of the placenta⁽¹⁾.Prolongation of the third stage of labor increases the complication rate, especially the incidence of postpartum haemorrhage (PPH)⁽¹⁾.

In addition,Postpartum hemorrhage (PPH) accounts for between one quarter and one-third of all maternal deaths worldwide and is the major cause of maternal mortality⁽²⁾.Furthermore,the third stage of labour is generally managed using two different approaches: active and physiological or expectant management⁽³⁾.

Active management generally includes administration of uterotonic agents, controlled cord traction, and uterine massage after expulsion of the placenta, helps to prevent PPH and reduce maternal mortality in all deliveries⁽⁴⁾. Expectant management of third

stage of labour mainly involves maternal effort assisted by gravity or putting the baby to the breast without using artificial oxytocin or early clamping or controlled cord traction⁽⁵⁾.

In the management of third stage of labour nowadays, it is a common practice to clamp both sides of the cord and cutting it then wait until there are signs of placental separation then deliver the placenta by controlled cord traction (brandet Andrews maneuver)⁽⁶⁾. Unclamping the cord at maternal side and releasing of 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 placenta and may reduce the duration of 3rd stage of labour⁽⁶⁾.

Cord drainage in 3rd stage of labour involves unclamping the previously clamped

and separated umbilical cord and allowing the blood from the placenta to drain freely into appropriate receptacles ⁽⁷⁾.

Thus, we designed a randomized clinical trial to compare the effectiveness of placental cord drainage with no drainage in reducing the duration and blood loss in 3rd stage of labour.

Materials and Methods

The study was conducted in Ain Shams University Maternity Hospital labourward. The protocol was explained to the patients and informed consent was obtained. The inclusion criteria were singleton, term pregnancy (gestational age 37 complete weeks confirmed by certain LMP or early ultrasound), no maternal obstetric or medical complication, no fetal compromise or anomaly, the route of delivery was normal vaginal delivery, forceps extraction, and vacuum extraction. Patients with preterm delivery, postterm delivery, premature rupture of the membranes, antepartum hemorrhage, history of postpartum hemorrhage, previous cesarean section, multifetal gestation, and fetal death were excluded from the present study.

The patients were randomized to the study group or the control group according to the code kept in a sealed envelope. The envelope was opened when the obstetrician performed vaginal delivery. For all women, the time of birth was recorded and then the cord was clamped and cut immediately after birth.

A total 180 women of patients were divided randomly into 2 groups, as follows:

Group A: 90 patients was the study group (cord drainage).

Group B: 90 patients was the control group (no cord drainage).

In the study group a of total number of 90 women placental end of the cut umbilical cord 1st was clamped for few seconds and then unclamped and left open to drain blood in a vessel until flow stopped. In the control group a total number of 90 women placental end of the cut umbilical cord was kept clamped. Also, blood loss in the third stage measured using a Kelly's pad which used during delivery and the blood lost collected in a clean metal bowl which kept at the tail end of Kelly's pad. Placenta was delivered by controlled cord

traction once signs of placental separation was seen. Intramuscular oxytocin 5u was given after delivery of fetus in both group after exclusion of contraindication of its use.

Once the uterus was well contracted and active bleeding was stopped, remaining blood in the vagina had been removed and sterile sanitary pad had been given.

The duration of 3rd stage of labour was calculated using stopwatch.

The pulse rate, blood pressure and state of uterus was noted immediately.

Investigation

- Hemoglobin level
- Hematocrit value
- Blood group
- Rh

The study was done after approval of ethical board of King Abdulaziz university and an informed written consent was taken from each participant in the study.

Statistical analysis

Statistical analyses were performed using SPSS version 17 (IBM, Armonk, NY). Normal distribution of continuous variables was assessed using the Kolmogorov–Smirnov test, chi-square analysis was used for categorical variables, Student t-test was used for the analysis of normally distributed continuous variables, and the Mann–Whitney U-test was used for abnormally distributed variables. *P* value of <0.05 indicated statistical significance.

Results

180 women were recruited and randomized, 90 women were in the study group, and 90 women were in the control group. In the current study, there were no statistical significant differences between the study and the control groups regarding maternal age, body mass index (BMI), gestational age and parity as shown in **Table (1)**. On the other hand, mean duration of third stage labour was significantly shorter in the study group compared to the control group as shown in **Table (2) and Figure (1)**.

Moreover, there were no significant differences between study and control groups regarding preoperative Hemoglobin, preoperative hematocrit, preoperative pulse rate, preoperative SBP and preoperative DBP as shown in Table (1). On the other side,

Postoperative Hemoglobin, Postoperative Hematocrit, Postoperative pulse rate, Postoperative SBP and postoperative DBP, were significantly higher in study group than control group as shown in Table (2). In addition, Hemoglobin, Hematocrit, Pulse rate, SBP as well as DBP significantly decreased postoperative in both groups as shown in Table

(2). Furthermore, retained placenta (manual removal) and blood transfusion were non-significantly less frequent among study group than among control groups as shown in Table (2). Also, the present results showed significant reduction in blood loss in the third stage of labour in study group as compared to control group (Table 2 and figure 2).

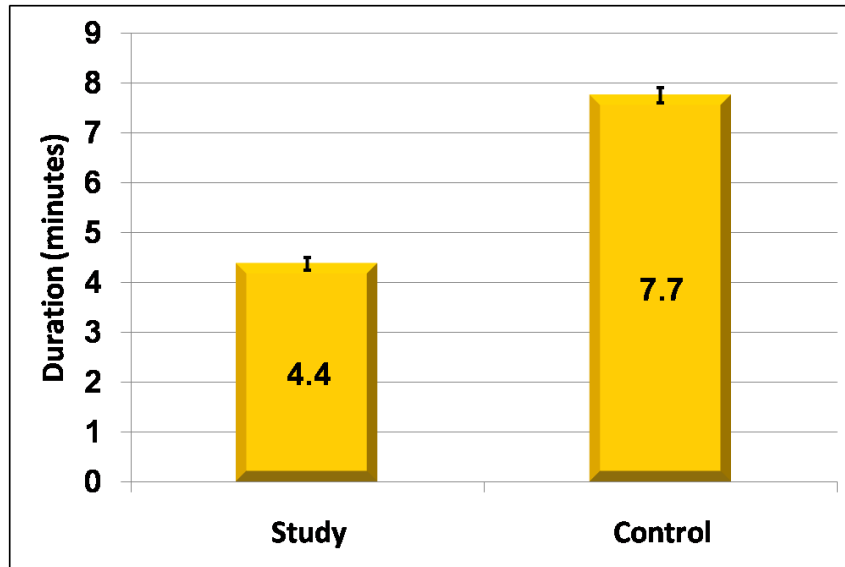


Figure (1): Comparison between study and control groups regarding duration of the third stage.

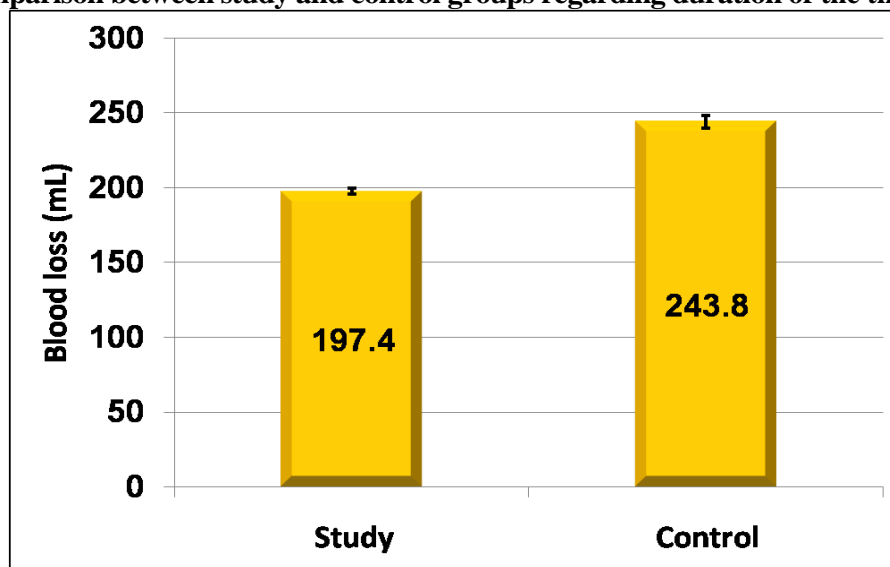


Figure (2): Comparison between study and control groups regarding blood loss in the third stage.

Table (1): Patient characteristics of two groups

Variable	Study group (N=90)	Control group(N=90)	p-value
Age (years)	28.0±5.1	28.7±4.6	0.343
BMI (kg/m ²)	28.9±1.3	28.8±1.3	0.497
Gestational age (weeks)	39.5±1.1	39.3±1.0	0.245
Parity	1.9±1.6	1.8±1.4	0.840
Preoperative Hemoglobin (gm/dL)	11.9±1.5	11.9±1.2	<0.001*
Preoperative Hematocrit(%)	33.0±3.8	33.3±3.1	<0.001*
Preoperative pulse rate (BPM)	83.7±5.9	83.8±5.1	0.860
Preoperative SBP (mmHg)	118.5±4.4	118.3±4.3	0.733
Preoperative DBP (mmHg)	10.7±1.6	10.2±1.2	0.612

^Independent t-test.

Data were represented as mean ±S.D.

*Significant

Table (2): Comparison of the maternal outcomes between study and control groups.

Variable	Study group (N=90)	Control group(N=90)	p-value
Duration of third stage of labour (min)	4.4±1.2	7.7±1.5	<0.001*
Blood loss (mL)	197.4±18.4	243.8±40.4	<0.001*
Postoperative pulse rate (BPM)	89.0±6.6	91.6±6.2	0.007*
Postoperative Hemoglobin (gm/dL)	10.7±1.6	10.2±1.2	<0.001*
Postoperative SBP (mmHg).	112.4±5.3	109.1±5.5	<0.001*
Postoperative DBP (mmHg)	66.6±4.9	64.2±4.5	<0.001*
Postoperative Hematocrit(%)	30.6±3.7	29.5±3.0	<0.001*
Retained placenta (manual removal) (n%)	0 (0.0%)	2 (2.2%)	0.497
Blood transfusion (n%)	0 (0.0%)	1 (1.1%)	1.000

^Independent t-test.

Data were represented as mean ±S.D.

*Significant

Discussion

Placental cord drainage has been suggested as a way of minimizing the impact of cord clamping on the third stage of labour for mothers. It involves the clamping and cutting of the umbilical cord after delivery of the baby but, afterwards, immediately unclamping the maternal side of the cord and allowing the blood from the placenta to drain freely into a container. It has been suggested that draining blood from the placenta would reduce its bulkiness, allowing the uterus to contract and retract, thus aiding delivery⁽⁶⁾.

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

In the current study, there is no significance difference between study and control group regarding mean age, BMI, mean gestational age and mean parity. On the other hand, the mean duration of third stage of labour of women included in study group was 4.4 ± 1.2 min and in control group was 7.7 ± 1.5 min. This shows that duration of third stage of labour was significantly lower in study group than control group.

This result is in agreement with **sharma et al.**⁽⁸⁾ who included 958 pregnant women having vaginal delivery who were randomized to drainage group and controlled cord traction group for placental delivery. They show that the mean duration of third stage of labour was 3.3 min in placental drainage group in contrast to 6.2 min in controlled cord traction method. They found that the duration of the third stage of labour significantly decreased after placental blood drainage before delivery of placenta, which is certified with this study.

Moreover, similar results were reported in study performed by **shravage and silpa**⁽⁹⁾ who included 200 pregnant women to evaluate the effectiveness of placental blood drainage via umbilical cord in reducing the duration of third stage of labour and the incidence of postpartum hemorrhage. They

show that the mean duration of third stage was 5.02 ± 1.71 min in cord group compared to 7.42 ± 2.56 min in control group. So, they concluded that placental drainage during third stage of labour reduces duration of blood loss thereby preventing postpartum hemorrhage. Also, the results of this study agreed with that of **Giacalone et al.**⁽¹⁰⁾ who included 477 pregnant women to compare 239 women who had placental cord drainage with 238 women with expectant delivery of placenta, so they showed the median value of the duration of the 3rd stage of labour was 8 ± 2.40 min in cord drainage group and 15 ± 1.45 min in the control group and from their study they found that the duration of third stage of labour significantly decreased after placental blood drainage before delivery of placenta.

Gulati et al.⁽¹¹⁾ studied 200 women to evaluate placental blood drainage during vaginal delivery as a method of shortening the duration of 3rd stage and reducing the amount of blood loss and concluded that duration of 3rd stage of labour in the control group was 5.72 minutes and in the study group it was 2.94 minutes.

Furthermore, in the present study the mean amount of blood loss in women included in study group was 197.4 ± 18.4 ml this was less than control group which was 243.8 ± 40.4 ml. This indicated that blood loss in third stage of labour significantly lower in study group than control group. This finding is in agreement with **shravage and silpa**⁽⁹⁾ who reported that the amount of blood loss was 175.05 ± 118.15 ml in cord group compared to 252.05 ± 145.48 ml in control group. So, they concluded that placental drainage during third stage of labour reduces amount of blood loss.

Also, **Gulati et al.**⁽¹¹⁾ concluded that the amount of blood lost in the 3rd stage was 247.59 ml in the control group and 193.63 ml in the study group. In addition, **Giacalone et al.**⁽¹⁰⁾ showed that the amount of blood loss significantly decreased after placental blood drainage before delivery of the placenta.

There were no significant difference between study and Control groups regarding preoperative pulse rate, Systolic blood

pressure, diastolic blood pressure. The Postoperative pulse rate, Systolic blood pressure, diastolic blood pressure were significantly higher in study group than control group and Pulse rate.

In the current study, the preoperative and postpartum hemoglobin and hematocrit between the two studies groups show that the mean preoperative Hemoglobin of women was 11.9 ± 1.5 gm/dL in study group and 11.9 ± 1.2 gm/dL in control group, the mean postpartum hemoglobin of women was 10.7 ± 1.6 gm/dL in study group and 10.2 ± 1.2 gm/dL in control group, the mean preoperative hematocrit value of women included and were 33.0 ± 3.8 % in study group and 33.3 ± 3.1 % in control group and the mean postpartum hematocrit value of women was 30.6 ± 3.7 % in study group and 29.5 ± 3.0 % in control group.

These results indicated that there were no significant difference between study and control groups regarding preoperative Hemoglobin and haematocrit. The Postoperative Hemoglobin and hematocrit were significantly higher in study group than control group, Reduction in Hemoglobin and hematocrit was significantly less in study group than control group.

The results of our study show that the Incidence of postpartum hemorrhage was 2.2% in the control group and 0% in the study group. retained placenta was observed in 2.2% in the control group and in 0% in the study group. So, the retained placenta (manual removal), PPH and Blood transfusion were non-significantly less frequent among study group than among control group.

Gulatiet al.⁽¹¹⁾ reported in their study that 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.

Our results are agreed with that of **shravage and silpa**⁽⁹⁾ who found that the incidence of postpartum hemorrhage was 3% in the study group and 10% in the control group. There were no cases of retained placenta.

In conclusion: placental blood drainage is simple, safe and non invasive method which reduces duration and blood loss of third stage of labour thereby preventing postpartum complication.

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