Placental Cord Drainage: Its Effect on Duration and Blood loss of Third Stage of Labor

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Abstract

Background: the present study aimed to evaluate the effect of placental cord drainage on duration and blood loss of third stage of labor**. Design:** Randomized controlled trial was utilized. **Setting:** The study was performed at delivery unit of Obstetrics and Gynecology Departments, Mansoura University Hospital, Egypt. **Subjects:** One hundred forty parturient women undergoing normal vaginal delivery attained the inclusion criteria were comprised. The entrants were divided equally by simple randomization into intervention group (n=70 women) who underwent placental cord drainage and control group consisted of (n=70 women) who received the conventional hospital protocol**. Tools:** Structured interview schedule and labor assessment sheet were used for collecting the data. **Results:** The mean of third stage assessment parameters showed statistically significant difference, where it was significantly shorter in favor of the intervention group than control group. Time elapsed until appearance of placenta separation signs was (3.657 ± 0.678 vs. 6.514 ± 0.829 min.), duration of 3rd stage was (4.528 ± 0.557 vs. 7.185 ± 0.665 min.) and the amount of blood loss was (192.50 ± 9.545 vs. 289.285 ± 11.711 ml.) respectively. However, there was no statistically significant difference observed between both groups regarding placenta weight. Furthermore, the incidence of relaxed uterus, Postpartum hemorrhage and the need for uterotonic drugs were lower in intervention group in comparison to those in control group by 17.1%, 10% and 10% respectively. 7.1% of control group had retained placenta. **Conclusion:** The current study findings highlighted that placental cord drainage was an effective method in reducing the duration and blood loss of third stage of labor in normal vaginal deliveries. **Recommendations**: Placental cord drainage should be encouraged in normal vaginal deliveries and conducting similar studies on a wide range of sample in multicenter settings for generalizing the findings.

Keywords: Placental Cord Drainage, Blood loss & Third Stage Labor.

Introduction:

Labour is a physiological process; however, it is linked to an increase in maternal morbidity and mortality, with blood loss being the most common cause. Primary postpartum hemorrhage (PPH) refers to blood loss of 500 ml or more within 24 hours after normal vaginal birth **(Chaudhary et al., 2020).** The third stage of labor (TSL) starts shortly after the baby is born and culminates when the placenta and fetal membranes being expelled. **(Smith, 2020).** PPH is a major

cause of maternal mortality and severe morbidity all over the world during TSL. The World Health Organization (WHO) estimates that about 25–30%. Most of these deaths are due to PPH **(Helmy et al., 2018) &** (**El Badawy et al., 2017).** It is estimated that this case is responsible for one-third of all maternal mortality in Africa and Asia. The PPH death index was 6.6 percent (extend between 0.0 percent -40.7 percent) which is highest in developing and low-income countries **(Maswim & Buchmann., 2017).**

The third stage is managed in regard to obstetric problems and prognosis of mothers. **(GBD 2015).** Delivery of the placenta is associated with blood loss. Its amount relied on how long will be taken by the placenta to separate from the uterine wall and how efficacious the uterine contractions are. Elongation of the 3rd stage of labor raises the rate of complication especially the occurrence of PPH. **(Begley, 2015).** Timely placenta expulsion and an effective uterine contraction to stop bleeding are key element to prevent 3rd stage complications **(Elgzar et al., 2020].** The 3rd stage of labor is usually handled by 2 distinct methods that are frequently used to manage the 3rd stage of labor. They are active and anticipatory management. Active management includes oxytocin provision, early bracing and cut of the cord of the umbilica, holding till indicators of placental detachment occur, and then delivering the placenta by guided cord grasping (Brandet Andrews Maneuver). **[Dahlke et al., 2015].** The expectant management primarily includes maternal effort reinforced by gravity, nipple stimulation through breast feeding and skin-to-skin contact immediately after birth **[Hofmeyr et al., 2015].**

The new trend in 3rd stage management is placental cord drainage (PCD). The process of loosening the clamp of the cord at the mother's side and excreting placental blood to allow placental delivery is known as placental cord drainage. It is physiologically possible that PCD will minimize its bulk density, enabling the uterus to contract and withdraw efficiently, resulting in placenta delivery. Also, it may reduce the duration of 3rd stage of labor and lower the incidence of PPH. **(Chaudhary et al., 2020).** It is exhorted to loosen the cord clamp from the mother's side and extract the blood from the placenta to facilitate giving birth of placenta **(Sreelatha et al., 2013).** On the contrary, **Amorim (2015)** reported that PCD has little or no leverage on either the length of the 3rd stage of labor or the amount of blood lost.

Midwifery nurses should be able to give the necessary supervision and care through all stages of labour and post-partum period (Wu, Chen, Wang, and Wang 2017). This care includes all preventive measures, the detection of abnormal cases execution of emergency measures and seeking for new trends for promoting safe deliveries **(egley et al., 2015).** The prolonged 3rd stage of labour is considered as a significant factor of PPH, so mothers should be monitored closely. Assessment of vital signs continually and assessment of the amount of blood loss until the expulsion of placenta are the main role of midwifery nurse to prevent possible complications **(Hofmeyr, Mshweshwe & Gulmezoglu., 2015)**. PCD can or cannot be used together with other routine interventions

like administration Pitocin drug in order to contract the uterus, controlled cord traction or maternal force. Accordingly, nursing care should be focused on close observation to monitor mothers' condition and note possible complication early for safe intervention **(Roy et al., 2016)**. So that, the study was conducted to empower the role of the nurse for maintaining safe delivery and prevention of PPH.

Significance of the study:

Globally, it was estimated about 127,000 women pass away as a consequence of Postpartum Hemorrhage (PPH). PPH is responsible for about 25% of maternal mortality rate in the developing countries. Management of 3rd stage of labour is the keystone for preventing PPH. Placenta cord drainage effect on the outcome of 3rd stage of labor for preventing and reducing the postpartum hemorrhage is still contention **(Elgzar et al., 2020).** Insufficient randomized clinical trials have been conducted in clinical practices to evaluate the effect of placental cord drainage. Few of published studies have shown a significant effect for facilitating delivery of the placenta and improve the outcome of 3rd stage of labor. On the contrary, some of them showed no clear findings had been drown on its positive or harmful effects **(Parveen et al, 2020).** Consequently, the current study was conducted to evaluate the effect of such matter.

Aim of the study:

The study aimed to evaluate the effect of placental cord drainage on duration and blood loss of third stage of labor.

Study Hypothesis:

Women who exposed to PCD have more favorable 3rd stage outcome and exhibit reduction in the duration and blood loss of 3rd stage of labor than women who don't.

Operational definitions:

Placenta cord drainage (PCD): Is the process of loosening the clamp of the cord at the mother's side and excreting placental blood to allow placental delivery.

3rd stage of labour (TSL): Refers to the 3rd stage duration, time elapsed until appearance of placental separation signs, amount of blood loss during the 3rd stage of labour, incidence of retained placenta, and need for blood transfusion during the early postpartum period.

Subjects and Method

Study design:

Randomized controlled trial.

Setting:

The study was carried out at labor and delivery unit belonging to Obstetrics and Gynecology Departments, Mansoura University Hospital in Egypt. It consisted of three operating theaters for normal and cesarean section deliveries as well gynecological operations. So that, the pre-mentioned setting was selected as it has higher patients flow rate as well higher rate of utilization of its health

services are provided for large number of pregnant and parturient women in Dakhalia governance.

Sampling:

Out of 257 women, one hundred forty parturient women who had admitted to the labor unit and were eligible to be enrolled in the study according to the subsequent inclusion criteria:

- Aged 20 to 35 years.
- Spontaneous normal vaginal delivery.
- Singleton pregnancy of full-term fetus with vertex presentation.
- Gestational age thirty-seven entire weeks verified by definite LMP or earlier ultrasound.
- Haven't any high-risk conditions.

Exclusion criteria:

Women who had a preterm or post-term birth, premature rupture of the membranes (PROM), antepartum hemorrhage, history of postpartum hemorrhage, caesarean section and multifetal pregnancy, or fetal death were omitted from the study.

Sample size:

The sample size was estimated by using G power program through the following data: effect size 0.5, α error prop 0.05, power (1-β err prop) 90 % using in dependent t test to detect mean between two equal groups. Sample size is 140 participants.

Groups allocation:

All women who participated in the study were divided equally by simple randomization in 2 groups (intervention group and control group). Allocation was done by using sealed opaque envelope that involve coded number either number 1 for cases included in the intervention group (n=70) who underwent PCD and number 2 for cases included in control group(n=70) who received the conventional hospital protocol of management of 3rd stage of labor.

Tools of Data Collections:

To accomplish the study aim, two tools were developed and utilized by the researchers to collect data after reviewing related literature.

Tool I: Structured interview Schedule: It entailed two parts for collecting the basic data:

Part 1: Sociodemographic characteristics:

Including questions that involves age, occupation and level of education, residence & BMI.

Part 2: Obstetric history Schedule& Initial Assessment Data sheet:

It consisted of questions regarding number of gravidities, parity, gestational age, and history of postpartum hemorrhage, retained placenta, and previous labor complications. Also, it concerned with data that obtained on admission such as blood investigation results (pre-delivery Hb, HCT) abdominal examination findings (i.e., fundal level, fetal presentation and position, and fetal heart rate), vaginal examination finding with the total Bishop score at the time of labour room attendance, and the finding of abdominal ultrasound scanning was

included; in order to identify the eligibility to the study.

Tool II: Labor Assessment Sheet:

It entails 3 major parts. **Part I:** Summary of the 1st and 2nd stage of labour. It collected data like length of the 1st labor and 2nd stage of labor, and incidence of episiotomy or tears. **Part II:** 3rd stage assessment sheet was used to assess the parameters of 3rd stage as (Time of first sign of placental separation, duration of third stage of labor, blood loss, placenta weight, incidence of retained placenta, manual removal of the placenta). **Part III:** Early postpartum assessment sheet. It described the intervention done through the following data included (PPH incidence, need of uterotonic drugs, type and dose of uterotonic drugs given, blood transfusion).

Validity and Reliability of Tools:

The tools were reviewed by a jury consisted of three specialized professors in midwifery nursing field to test the content validity and to assure that the tools were carrying the purposed meaning. The suggested modifications and modulation were considered according to their notes and remarks. Cronbach's alpha test was used to measure the tools' reliability. It revealed that Labor Assessment Sheet = (r=0.85), Hence the tool was reliable.

Pilot Study:

Fourteen parturient women involved in the pilot study. It was implemented to evaluate the feasibility, clarity of the designed questionnaire and to estimate the required period for collecting the data. Accordingly, the necessary revision and modifications were performed, these women were excepted from the study sample.

Ethical Considerations:

The study was approved by the ethics committee of the nursing faculty and the director of obstetrics and gynecology Hospital. An informed assent was gathered from women who involved in the study. Participant's privacy and information's confidentiality were maintained and assured that the study maneuvers couldn't cause any hurt. Also, they informed about their right to regress from the study at any period.

Method:

- An official approval letter was attained from the head of Department of Obstetrics and Gynecology, Mansoura University as well from the ethics committee at the faculty of nursing, Mansoura University in Egypt to gain their permission to carry out the research after explanation of its aim and scientific contextual. Then, the researchers developed all tools after intensive reviewing of the relevant literatures.

- Content validity of the tools has been tested by jury of three expertise in the filled of obstetrics and gynecology nursing and one of the statistics filed. Tool's reliability has been tested using Cronbach alpha coefficient test (r=0.85).

- Researchers spent 6 months to collect the data started from October 2020 till March 2021.

- After obtaining the demographic data of all the participants, an elaborated history was obtained. General and obstetric examination was done to assess gestational age, fetal presentation and status of labor at the time of admission in labor room as well as to exclude those at risk for PPH or cesarean birth. Blood sample was taken for baseline investigations (complete blood count, RH factor).

- An official informed consent was obtained from each woman who undergoing normal vaginal deliveries and was eligible to participate in the study based on the inclusion and exclusion criterion after explaining the study aim and process. The researchers stressed that taking share in the study is completely optional, and data protection was guaranteed. they were informed about their right to reject participation without any consequences.

- All women who participated in the study were randomly divided equally in 2 groups (intervention group and control group). Allocation was done by using sealed opaque envelope that involve coded number either number 1 for cases included in the intervention group (n=70) and number 2 for cases included in control group(n=70).

- The envelope was conquered after vaginal birth by the obstetrician. The time of birth was registered for all mothers, and the cord was fastened and cut instantly for few minutes till handling and receiving of the newborn.

- Regarding intervention group (1), The cut umbilical cord was unhooked and held loose to allow blood to flow, a graduated container till the bleeding stopped and signs of placental detachment emerged. This prohibited the drained blood from being jumbled with the blood lost in the third stage. Meanwhile, women in the control group (2), the umbilical cord remained clamped. Blood loss in the third stage was collected in a clean special container.

- For both groups, placenta is delivered by controlled cord traction (Brandt-Andrew's maneuver) after appearance of placental detachment signs. Once the uterus become hard, contracted and bleeding is stopped the remaining blood is removed from vagina. Towels used in episiotomy discarded. It was essential not to shuffle the extracted blood from the cord with the blood lost throughout the third stage. If placenta did not separate and failed to expel within 30 minutes of the newborn delivery it was reported as a retained and an additional intervention needed to separate then patient will be excluded from the study. The extracted blood was on record as well in milliliters (mL) by using graduated container.

- All women in both groups managed according to the department protocol, which includes 3 constituents of active management of 3rd stage of labour (AMTSL) involved Injection oxytocin 10 IU intramuscular given on anterior aspect of thigh, uterine massage and Control cord traction.

- Primary outcome was assessed through the following parameters and recorded in labor assessment sheet (The duration

of 3rd stage of labour, blood loss amount, weight of placenta, incidence of retained placenta and manual evacuation and removal of the placenta).

- Secondary outcome was assessed through (Vital signs and the condition of the uterus, PPH incidence, need of uterotonic drugs, type and dose of uterotonic drugs given, the need for blood transfusion was assessed before discharge).

Statistical Analysis:

All statistical tests were conducted using SPSS for windows version 20.0. Continuous data were normally distributed and were expressed in mean ±standard deviation (SD). Categorical data were expressed in frequency and percentage. The comparisons were determined using independent t test for two variables with continuous data. Chi-square test was used for comparison of variables with categorical data. Statistical significance was set at $p<0.05$.

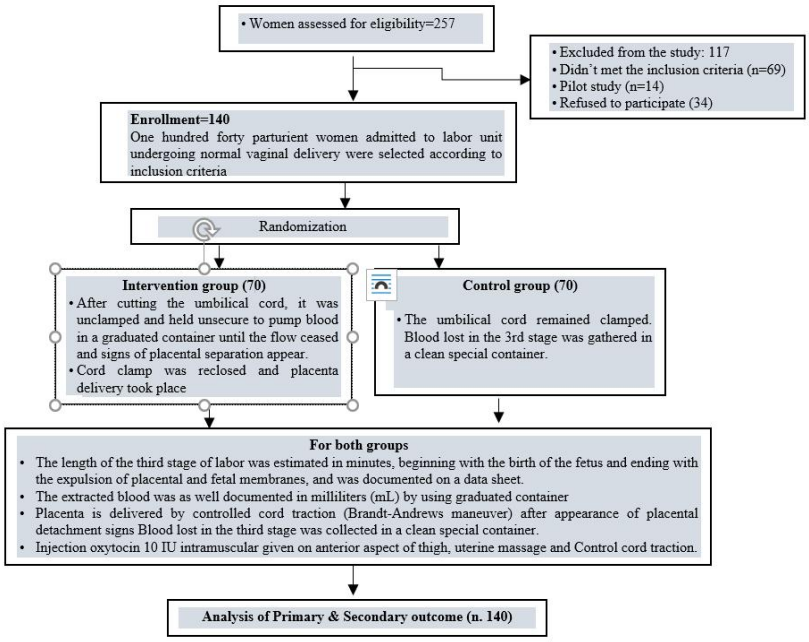


Fig. (1) Flowchart of the research process

Results

Table (1): shows no statistically significant differences between intervention and control group regarding their socio-demographic distinguishing features According to the findings of the study, approximately half of studied sample were at age of 20-25 year with a mean age of 26 ± 3.54 years. and 25 ± 2.67 yrs. of women in intervention and control group respectively. As regards the educational level, it was found that 42.9% and 40% of the studied sample were had secondary& university education among intervention group and control group respectively. In addition, more than half was from urban areas (55.7% and 48.6%), and (55.7% & 57.1%) have BMI from 18.5 to 24.9.

Table (2): shows no statistically significant differences between both groups in relation to their obstetrics history and pre-delivery investigation. The gestational age was similar in both group (38.800 ± 0.772). Furthermore, the Pre-delivery Hb and HCT is 11.442 ± 0.878 and 31.585 ± 0.876 for intervention group compared to 11.471 ± 0.775 and 31.614 ± 0.889 for control group.

Table (3): Illustrates that no statistically significant differences between both groups regarding labour summary, where the mean duration of the 1st and 2nd stage of labour is (8.142 ± 0.665 & 55.643 ± 3.092) and (7.988 ± 0.435 & 56.571 ± 2.779) for the intervention and control group respectively. In addition, the percentage of episiotomy was 34.3% in the intervention group compared to 41.4 % in control group.

Table (4): Shows that there was statistically significant difference in the mean of third stage assessment parameters, where the mean time of labor assessment parameters was significantly shorter in favor of intervention group than control group. Time elapsed until appearance of placenta separation signs was (3.657 ± 0.678 vs. 6.514 ± 0.829 min.), duration of 3rd stage was (4.528 ± 0.557 vs. 7.185 ± 0.665 min.) and the amount of blood loss was (192.50 ± 9.545 vs. 289.285 ± 11.711 ml.) respectively. While there was no statistically significant difference observed between the two groups regarding placenta weight. Furthermore, 7.1% of control group had retained placenta.

Table (5): shows statistically significant difference between both groups in most of early post-partum assessment parameters. The relaxed uterus, incidence of PPH and the need for uterotonic drugs were lower in intervention group in comparison to those in control group by 17.1%, 10% and 10% respectively. Syntocinon was the most common uterotonic drug used and mostly injected in intravenous solution in 61.4% in both groups.

Figure (2): The duration of 3rd stage of labor and the amount of the blood loss was lower among women of the study group compared to those in control group by (4.528 ± 0.557 vs. 7.185 ± 0.665 min.) and (192.50 ± 9.545 vs. 289.285 ± 11.711 ml.) respectively fig. (2).

Table (1): Socio-demographic characteristics of the studied sample.

Items	Intervention group No (70)	%	Control group No (70)	%	Significance test
Age (years)					
▪ 20 - 25	35	50.0	30	42.9	*p*=0.577
▪ 26 -30	15	21.4	20	28.6	X^2 = 1.099
▪ 31- 35	20	28.6	20	28.6	
Mean ±SD	26 ± 3.54		25 ± 2.67		*p*=0.492 t =1.635
Occupation					
▪ House wife	32	45.7	34	48.6	*p*=0.433
▪ Working	38	54.3	36	51.4	X^2 =0.115
Educational level					
▪ Read and write	13	18.6	23	32.9	*p*=0.120
▪ Primary & preparatory	27	38.6	19	27.1	X^2 =4.238
▪ Secondary& university	30	42.9	28	40.0	
Residence					*p*=0.249
▪ Urban	39	55.7	34	48.6	X^2 =0.716
▪ Rural	31	44.3	36	51.4	
Religion					*p*=0.113
▪ Muslim	57	81.4	63	90.0	X^2 =2.100
▪ Others	13	18.6	7	10.0	
BMI					*p*=0.500
▪ 18.5-24.9	39	55.7	40	57.1	X^2 =0.029
▪ ≥ 25	31	44.3	30	42.9	

X^2= Chi square test, significance considered if *p* value less than 0.05* t= Independent t test, significance considered if *p* value less than 0.05*

Table (2): Obstetric history and pre-delivery investigations of the studied sample.

Items	Intervention group No (70)	%	Control group No (70)	%	Significance test
No. of gravida					
▪ One	31	44.3	30	42.9	*p*=0.981
▪ Two	22	31.4	23	32.9	X^2 =0.039
▪ ≥ three	17	24.3	17	24.3	
No. of parity					*p*= 0.420
▪ One	55	78.6	53	75.7	X^2 =0.162
▪ Two	15	21.4	17	24.3	
Gestational age (Mean ± SD)	38.800 ± 0.772		38.800 ± 0.772		p= 1.000 t=0.000
Pre delivery Hb (Mean ± SD)	11.442 ± 0.878		11.471 ± 0.775		*p*= 0.839 t=-0.204
Pre delivery HCT (Mean ± SD)	31.585 ± 0.876		31.614 ± 0.889		*p*=0.848 t=-0.191
History of retained placenta					
▪ Yes	34	48.6	30	42.9	*p*=0.305
▪ No	36	51.4	40	57.1	X^2 =0.461
History of labour complications					
▪ Yes	18	25.7	18	25.7	*p*=0.577
▪ No	52	74.3	52	74.3	X^2 =0.000
Feta heart rate (Mean ± SD)	137 ± 11.559		137.285 ± 11.877		*p*= 0.866 t=-0.144

X^2= Chi square test, significance considered if *p* value less than 0.05* t= Independent t test, significance considered if *p* value less than 0.05*

Table (3): Distribution of the study sample according to labor summary.

Items	Intervention group Mean ± SD	Control group Mean ± SD	Significance test
• Duration of 1st stage (Hours)	8.142 ± 0.665	7.988 ± 0.435	*p*= 0.001* t= -3.331
• Duration of 2nd stage (Minutes)	55.643 ± 3.092	56.571 ± 2.779	*p*= 0.303 t= -1.035
• New born weight (Grams)	3.395 ± 29.803	3.288 ± 25.397	*p*= 0.024* t= 2.289
Episiotomy or tear			
▪ Yes	24 (34.3%)	29 (41.4%)	*p*= 0.243 X^2 = 0.759
▪ No	46 (65.7%)	40 (58.6%)	

X^2= Chi square test, significance considered if p value less than 0.05* t= Independent t test, significance considered if p value less than 0.05*

Table (4): Distribution of the study subjects according to third stage assessment parameters.

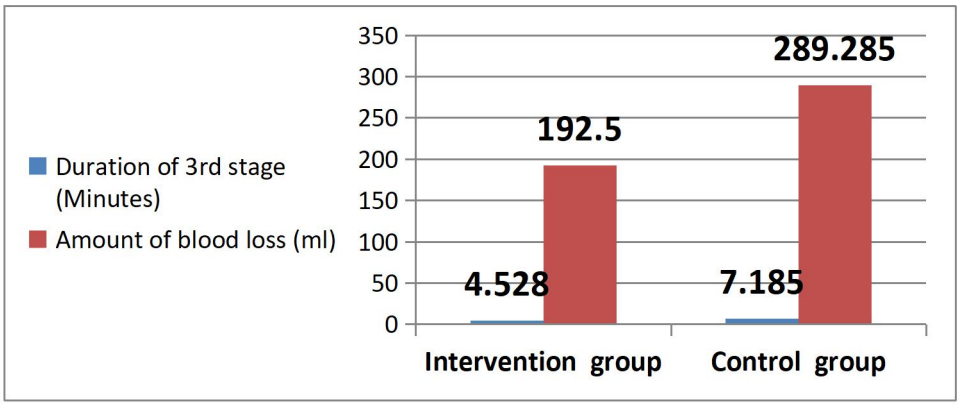
Items	Intervention group Mean ± SD	Control group Mean ± SD	Significance test
• Time elapsed until appearance of placenta separation signs (Min.)	3.657 ± 0.678	6.514 ± 0.829	*p*= 0.000** t= -22.304
• Duration of 3rd stage (Minutes)	4.528 ± 0.557	7.185 ± 0.665	*p*= 0.000** t= -25.602
• Amount of blood loss (ml)	192.50 ± 9.545	289.285 ± 11.711	*p*= 0.000** t= -53.594
• Placenta weight (g)	525.571 ± 19.459	530.285 ± 22.648	*p*= 0.189 t= -1.321
Retained placenta {no (%)}			
▪ Yes	0 (0)	5 (7.1)	*p*= 0.029* X^2 = 5.185
▪ No	70 (100)	65 (92.9)	

X^2= Chi square test, significance considered if p value less than 0.05* t= Independent t test, significance considered if p value less than 0.05*

Table (5): Frequency Distribution of the Studied Groups with reference to early postpartum assessment.

Items	Intervention group No (70)	%	Control group No (70)	%	Significance test
Uterus condition					
▪ Contracted	58	82.9	55	78.6	p= 0.334 X^2=0.413
▪ Relaxed	12	17.1	15	21.4	
Incidence of PPH					
▪ Yes	7	10	16	22.9	p= 0.033*
▪ No	63	90	54	77.1	X^2= 4.214
Need uterotonic drugs					
▪ Yes	7	10	16	22.9	p= 0.033*
▪ No	63	90	54	77.1	X^2= 4.214
Uterotonic drug type					
▪ Syntocinon	58	82.9	53	75.7	p= 0.202 X^2=1.087
▪ Methergine	12	17.1	17	24.3	
Route of drug administration					
▪ IV	43	61.4	43	61.4	p= 0.569
▪ IM	27	38.6	27	38.6	X^2= 0.000

Figure (2): Distribution of the study subjects with reference to duration of 3rd stage and amount of blood loss.



Discussion:

The current study aimed to evaluate the effect of placental cord drainage on duration and blood loss of third stage of labor. The study findings expressed that there was statistically significant difference among both groups in relation to the outcome of 3rd stage of labor as the mean interval of length of 3rd stage of labor was shorter and the amount of the blood loss was lower among women of the intervention group in comparison to those in control group. These study findings backed up the research hypothesis that Women who are exposed to PCD have more favorable 3rd stage progress and lower incidence of PPH than those in control group.

The outcomes of the current study indicated that there was no statistically significant difference between the two groups in respect of their basic features, such as age, educational level, job, and residence; similarly, there was no statistically significant difference between the two groups in respect of their obstetrics variable, indicating that both groups were well-matched. Similarly, the study findings revealed that there were no statistically significant differences between both groups regarding labour summary. These results emphasized that the great homogeneity between both groups could decrease the incidence of postpartum hemorrhage. These results were congruous with **(Chaudhary et al., 2020)** who conducted randomized controlled trial to evaluate the length of 3rd labor stage after implementing placental cord drainage and reported in their study There was no significant difference seen in demographic profile and the gestational age at birth in two groups was seen of both the groups.

Concerning the assessment of 3rd stage parameters, there was statistically significant difference in the mean of third stage assessment parameters between both groups. It was evidenced that there

was statistically significant difference in the meantime of 3rd stage duration, as it was significantly shorter in favor of intervention group than control group. These findings were approved by **Parveen et al., (2020)** who found in their study that there was statistically significance difference regarding the length of 3rd labour stage whereas the mean length of 3rd labour stage was 8.5 in study group and 10.8 in control group. Such agreement reported by **Roy et al., (2016)** who implemented such study about (PCD) in India on 200 pregnant women and stated that there was matching between both groups as regard to the baseline data, as well as the duration of 3rd stage of labor was shorter in study group (210.5 s) compared to control group (302.5 s), with statistically significant difference. Similarly, the present study results are consistent with **Unal et al., (2014)** in their study carried out to test the impact of PCD on 3rd stage of labor. As it was significantly shorter among women in the cord drainage group than in those the control group (3.5 ± 1.9 vs. 7.7 ± 3.4 min., respectively). By the same token, **Afzal et al., [2019]** supported the findings and noticed that PCD had significantly decrease the time of 3rd stage of labor.

As regard to the quantity of blood loss, the study findings showed significant difference in favor of study group. This means that PCD may reduce the blood loss during 3rd labor stage and consequently decreasing PPH incidence. The study findings in the same line with **Elgzar et al., (2020)** who conducted similar study on one hundred and twenty women undergoing normal vaginal delivery. it pointed out that both blood loss and PPH incidence were lower among PCD group (195.45±13.994) than control group (265.45±21.920) respectively. Such agreement is reported by **Mithala *et al.*, [2018]**, who had conducted a randomized controlled trial to compare the quantity of blood loss and length of 3rd labor stage in PCD group. They found that mean time of 3rd stage duration was shorter in PCD group than control group, and conclude that PCD could decrease the length of 3rd labor stage and consequently reduced the quantity of blood loss.

The present study findings revealed significance difference existed between the intervention group compared to control group in relation to the uterine condition, incidence of PPH and the need for uterotonic drugs in favor of intervention group. These results were in the same line with **Mohamed et al., [2017] & Mithala et al., [2018]** who reported that the retained placenta was less frequent among PCD group than control. They further added that the need for postpartum blood transfusion was lower in PCD group compared to control without significant differences.

On the contrary, **Wu et al., (2017)** reported in a meta-analysis study conducted to evaluate the effect PCD on third stage of labor. They reported that in a collected analysis of nine trials, the duration of 3rd stage of labour was shorter among the PCD groups meanwhile, there was no significant difference in the amount of blood loss observed between groups. In like manner, Amorim, 2015 reported that PCD had no impact on either the quantity of blood loss or the length of the third stage.

According to **Sreelatha et al, (2013)** who implemented a prospective study conducted on one hundred women having vaginal delivery, whereas they considered PCD effective way to decrease the length and quantity of blood loss, additionally they found that there were no cases of retained placenta among the study group and only one case in control group which required manual removal of the placenta. There were no cases of PPH in the study group. furthermore, **Asicioglu et al., (2015)** reported in such study that no cases of retained placenta were found in the study group in comparison to 2% of cases in control group with statistically insignificant difference. Overall, the present study findings approved that placenta cord drainage could significantly shorten the 3rd stage and minimize the quantity of blood loss.

Conclusion:

Overall, placental cord drainage during the third stage of labour was an effective non-invasive safe method in reducing the duration and blood loss of third stage of labour in normal vaginal deliveries.

Recommendations:

- PCD should be encouraged in normal vaginal deliveries.
- Conducting similar studies on a wide range of sample in multicenter settings for generalizing the findings.
- Conducting regular training programs and workshops for nurses and health care team about importance of PCD.

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Conflicts of Interest Disclosure

There are no potential conflicts of interest for the authors to reveal.

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