

COMPARISON OF OUTCOMES OF CONTROLLED CORD TRACTION VS SPONTANEOUS EXPULSION OF PLACENTA

Beenish Ambreen¹, Qurat-ul-Ain², Fakhar-un-Nisa³, Kiran Zafar⁴, Aleena Rasheed⁵, Wasif Shareef⁶, Samia Malik⁷

^{1,3} MBBS, Postgraduate Resident (PGR) Gynae & Obs Department National Hospital & Medical Centre, DHA, Lahore

² MBBS, Fellow Resident in Urogynecology Ganga Ram Hospital, Lahore

⁴ MBBS, FCPS, Assistant Professor, Abu Umara Medical College, Ali Fatima Hospital, Lahore

^{5,6} MBBS Student 4th Year Abu Umara Medical and Dental College, Lahore, Pakistan

⁷ MBBS, FCPS, MHPE, Consultant Gynaecologist, National Hospital & Medical Centre, Lahore

*Corresponding Author: Beenish Ambreen Email: beenishambreen64@gmail.com

ABSTRACTS:

Background: The third stage of labor is associated with risks such as prolonged placental delivery, postpartum hemorrhage, and retained placenta. Controlled cord traction is an established component of active management of the third stage of labor, whereas spontaneous placental expulsion avoids traction and allows natural delivery of the placenta. Comparison of maternal outcomes associated with these approaches may help evaluate their effectiveness during vaginal delivery.

Objectives: To compare the maternal outcomes of controlled cord traction versus spontaneous expulsion of the placenta during the third stage of labor.

Study Design & Setting: This study was conducted in the Department of Obstetrics & Gynaecology, National Hospital, Lahore, Pakistan from 15 May 2026 to 15 August 2026.

Methodology: A total of 200 women with singleton, cephalic pregnancies at ≥ 37 weeks planned for vaginal birth were included through non-probability consecutive sampling. Participants were randomly allocated into controlled cord traction (n=100) and spontaneous placental expulsion (n=100) groups. All participants received 10 IU intramuscular oxytocin after delivery. In the controlled cord traction group, traction was performed according to the WHO protocol, while in the other group the placenta was allowed to expel spontaneously. Duration of the third stage, blood loss, postpartum hemorrhage, retained placenta, manual removal, and change in maternal hemoglobin were assessed.

Results: Mean third-stage duration was 6.84 ± 2.31 minutes in the controlled cord traction group versus 9.72 ± 4.16 minutes in the spontaneous group ($p < 0.001$). Prolonged third stage occurred in 3.0% versus 10.0% ($p = 0.031$). Mean blood loss was 286.40 ± 112.65 mL versus 342.70 ± 145.32 mL ($p = 0.003$). PPH occurred in 5.0% versus 11.0% ($p = 0.123$). Mean hemoglobin change was -0.49 ± 0.48 versus -0.67 ± 0.55 g/dL ($p = 0.015$).

Conclusion: Controlled cord traction was associated with shorter third-stage duration and lower blood loss, while differences in PPH and retained placenta were not statistically significant.

KEYWORDS: Controlled cord traction; Placenta; Postpartum hemorrhage; Spontaneous placental expulsion; Third stage of labor.

INTRODUCTION

Postpartum haemorrhage (PPH) remains a major cause of maternal morbidity and mortality worldwide, including Pakistan. This underscores the need for reliable third-stage management, especially in high-volume public hospitals. 1 Active Management of the Third Stage of Labor (AMTSL) is the standard approach to reduce PPH and includes a prophylactic uterotonic, delayed cord clamping, and controlled cord traction (CCT). WHO guidance recognizes uterotonics as the essential component, with CCT recommended where trained providers can perform it safely. ²

Evidence shows that when uterotonics are routinely used, CCT offers little to no reduction in severe PPH (≥ 1000 mL) if it already has begun and helps only a modest reduction in PPH ≥ 500 mL, while primary clinical benefits include lowering the need for manual removal of the placenta.³ The multicenter TRACOR trial reported similar PPH ≥ 500 mL rates between the routine CCT arm and the standard spontaneous expulsion arm (9.8% vs 10.3%; RR 0.95, 95% CI 0.79 to 1.15).^{4,6} However, the TRACOR trial observed that the omission of CCT significantly increased the incidence of a prolonged third stage of labor (> 15 minutes) from 4.5% up to 14.3% (RR 0.31, 95% CI 0.25 to 0.39), alongside a higher rate of manual removal of the placenta (6.1% vs 4.2%) whereas, The proportion of women with a peripartum decrease in haemoglobin concentration of 40 g/L or more did not differ between the two arms (2.1%(41/1961) in the controlled cord traction arm and 1.8% (35/1953) in the standard placenta expulsion arm: relative risk 1.17 (95% confidence interval 0.75 to 1.82).^{4,6} This indicates that CCT's most consistent, measurable clinical effect is in reducing the risk of a prolonged third stage rather than substantially lowering hemorrhage rates.

Practice has evolved since these trials: delayed cord clamping is now standard and does not meaningfully

prolong the third stage,⁵ and modern protocols use quantitative blood loss (QBL) measurement for greater accuracy over visual estimates.⁶ In low- and middle-income countries, complete AMTSL adherence is variable, with skill-dependent steps like CCT being inconsistently performed due to workload and training gaps.⁷ Although generally safe when done correctly, CCT can rarely cause complications such as uterine inversion or cord avulsion if performed improperly.⁸

In this context, the key operational question for the healthcare system in Pakistan is whether spontaneous expulsion of the placenta—under current optimized AMTSL standards (universal uterotonic administration, delayed cord clamping, and standardized QBL)—is non-inferior to CCT in preventing a prolonged third stage of labor (>15 minutes) without increasing the incidence of secondary complications such as PPH ≥ 500 mL or retained placenta requiring manual removal. A strict, pre-specified non-inferiority margin of 4% in the incidence of a prolonged third stage is considered clinically acceptable and statistically justified based on historical background effect sizes from the TRACOR data. Demonstrating non-inferiority would support a simpler, less skill-dependent approach to third-stage management without compromising maternal safety, whereas demonstrating inferiority would robustly justify maintaining universal, mandatory CCT training across all clinical tiers.

The primary outcome is the proportion of patients experiencing a prolonged third stage (>15 min). Secondary outcomes include PPH ≥ 500 mL (measured by QBL), manual removal of placenta and change in maternal haemoglobin level. The results will directly inform policy, training priorities, and clinical workflow in Pakistan's maternity units. The objective was to compare the outcomes of controlled cord traction Vs spontaneous expulsion of placenta.

OPERATIONAL DEFINITIONS

Controlled Cord Traction (CCT): Controlled cord traction was defined as a procedure performed during the third stage of labor, after signs of placental separation, involving gentle and steady traction on the umbilical cord while applying counter-pressure on the uterus, following the WHO-recommended technique and performed by a trained birth attendant.²

Spontaneous Placental Expulsion: Spontaneous placental expulsion was defined as the delivery of the placenta without manual assistance or traction on the umbilical cord, allowing the placenta to be expelled naturally after administration of a prophylactic uterotonic.²

Prolonged Third Stage of Labor: Prolonged third stage of labor was defined as a duration exceeding 15 minutes from the delivery of the baby to the complete expulsion of the placenta and membranes, measured using a stopwatch.¹

Postpartum Hemorrhage (PPH): Postpartum hemorrhage was defined as cumulative blood loss of ≥ 500 mL within the immediate postpartum period, measured using a calibrated graduated drape and by weighing soaked materials using the quantitative blood loss method. The primary response variable was recorded as binary (Yes/No), while the exact blood loss volume in milliliters was also recorded as a continuous audit variable.¹

Retained Placenta: Retained placenta was defined as failure to deliver the placenta within 30 minutes of the baby's birth despite active management, or earlier if clinical concern regarding excessive bleeding necessitated intervention.^{1,2}

Change in Maternal Hemoglobin: Change in maternal hemoglobin was defined as the difference in hemoglobin concentration between the pre-delivery measurement, obtained within 24 hours before birth, and the measurement obtained at 24 ± 6 hours postpartum, using the same laboratory method for both measurements. The response variable was recorded as a continuous value in g/dL, with negative values indicating a decrease in hemoglobin concentration.¹

MATERIALS AND METHODS

This study was conducted in the Department of Obstetrics & Gynaecology, National Hospital, Lahore, Pakistan, over a period of three months after approval of the synopsis from 15 May 2026 to 15 August 2026. Non-probability consecutive sampling was used. Women aged ≥ 18 years who provided written informed consent were included. Eligible participants had singleton, cephalic pregnancies planned for vaginal birth at $\geq 37+0$ weeks, were haemodynamically stable at the time of delivery of the baby, and had an intact placenta in utero immediately after birth before placental expulsion, with no immediate indication for manual removal. Women with placenta previa, vasa previa, suspected placenta accreta spectrum, or clinically diagnosed placental abruption were excluded. Women requiring immediate manual removal of the placenta or having ongoing severe bleeding or postpartum hemorrhage (PPH) before randomization were also excluded. PPH was defined according to WHO thresholds.² Women with known coagulopathy, current therapeutic anticoagulation, platelet count $< 75 \times 10^9/L$, severe anaemia with pre-delivery hemoglobin < 8.0 g/dL, or haemodynamic instability requiring resuscitation were excluded. Women with a documented uterine anomaly or previous uterine inversion, intrauterine fetal demise in the index pregnancy, known hypersensitivity or contraindication to oxytocin, or inability to receive the standard prophylactic uterotonic were also excluded.

Following approval from the Institutional Ethical Review Committee, written informed consent was obtained from all participants. Primary patient data, including maternal age, parity, gestational age, and body mass index (BMI), were recorded, and all baseline investigations were performed. Participants were randomly allocated into

two groups, namely the controlled cord traction (CCT) group and the spontaneous placental expulsion group, using sealed envelopes or a digital randomizer. All participants received standard prophylactic oxytocin 10 IU intramuscularly following delivery, and delayed cord clamping was practiced for all participants. In Group A, controlled cord traction was performed according to the WHO-recommended protocol. In Group B, the placenta was allowed to expel spontaneously without traction on the umbilical cord. Blood loss was measured using a calibrated graduated drape and by weighing soaked materials. The time of placental delivery was recorded using a stopwatch. Hemoglobin levels were measured within 24 hours before delivery and again at 24±6 hours postpartum. Any indication for manual removal of the placenta was recorded. All study data were meticulously recorded on a predefined data collection form (Annexure 2), while confidentiality of participant information and participants' rights were fully ensured.

The collected data were analyzed using SPSS version 26. Frequencies and percentages were calculated for categorical variables, including PPH ≥500 mL and manual removal of the placenta, while means ± standard deviations were calculated for quantitative variables, including duration of the third stage of labor and change in hemoglobin level. The Chi-square test was used to compare proportions between the two groups, while the independent-samples t-test was used to compare continuous variables. A p-value of ≤0.05 was considered statistically significant.

RESULTS

The mean maternal age was 28.74 ± 4.21 years in the controlled cord traction group and 29.08 ± 4.36 years in the spontaneous placental expulsion group. The mean gestational age was 38.42 ± 1.16 weeks and 38.51 ± 1.21 weeks, respectively, while the mean BMI was 26.18 ± 3.42 kg/m² and 26.47 ± 3.58 kg/m², respectively. In the controlled cord traction group, 42 (42.0%) women were primiparous and 58 (58.0%) were multiparous, compared with 39 (39.0%) and 61 (61.0%), respectively, in the spontaneous placental expulsion group. The mean pre-delivery hemoglobin was 11.42 ± 0.86 g/dL in the controlled cord traction group and 11.38 ± 0.89 g/dL in the spontaneous placental expulsion group. None of the baseline characteristics showed a statistically significant difference between the groups, as given in Table 1.

Table 1. Comparison of Baseline Demographic and Clinical Characteristics Between the Study Groups

Variable	Controlled Cord Traction (n=100)	Spontaneous Placental Expulsion (n=100)	p-value
Maternal age (years)	28.74 ± 4.21	29.08 ± 4.36	0.576
Gestational age (weeks)	38.42 ± 1.16	38.51 ± 1.21	0.590
BMI (kg/m ²)	26.18 ± 3.42	26.47 ± 3.58	0.557
Parity, n (%)			
Primipara	42 (42.0)	39 (39.0)	0.781
Multipara	58 (58.0)	61 (61.0)	
Pre-delivery Hb (g/dL)	11.42 ± 0.86	11.38 ± 0.89	0.744

The mean duration of the third stage of labor was 6.84 ± 2.31 minutes in the controlled cord traction group compared with 9.72 ± 4.16 minutes in the spontaneous placental expulsion group. The difference between the groups was statistically significant (p<0.001). Placental expulsion within 15 minutes occurred in 97 (97.0%) women in the controlled cord traction group and 90 (90.0%) women in the spontaneous placental expulsion group. A prolonged third stage of labor exceeding 15 minutes was observed in 3 (3.0%) and 10 (10.0%) women, respectively, with a statistically significant difference (p=0.031), as given in Table 2.

Table 2. Comparison of Duration of the Third Stage of Labor Between the Study Groups

Duration of third stage of labor	Controlled Cord Traction (n=100)	Spontaneous Placental Expulsion (n=100)	p-value
Mean duration (minutes), mean ± SD	6.84 ± 2.31	9.72 ± 4.16	<0.001
≤15 minutes, n (%)	97 (97.0)	90 (90.0)	0.031
>15 minutes, n (%)	3 (3.0)	10 (10.0)	

The mean blood loss was 286.40 ± 112.65 mL in the controlled cord traction group and 342.70 ± 145.32 mL in the spontaneous placental expulsion group, with a statistically significant difference between the groups (p=0.003). Postpartum hemorrhage with blood loss ≥500 mL occurred in 5 (5.0%) women in the controlled cord

traction group and 11 (11.0%) women in the spontaneous placental expulsion group. The difference in the frequency of PPH between the groups was not statistically significant ($p=0.123$), as given in Table 3.

Table 3. Comparison of Postpartum Hemorrhage and Blood Loss Between the Study Groups

Outcome	Controlled Cord Traction (n=100)	Spontaneous Placental Expulsion (n=100)	p-value
Blood loss (mL), mean $\pm$ SD	286.40 $\pm$ 112.65	342.70 $\pm$ 145.32	0.003
PPH $\geq$ 500 mL, n (%)	5 (5.0)	11 (11.0)	0.123
No PPH, n (%)	95 (95.0)	89 (89.0)	

Retained placenta was observed in 2 (2.0%) women in the controlled cord traction group and 8 (8.0%) women in the spontaneous placental expulsion group. Manual removal of the placenta was required in 2 (2.0%) women in the controlled cord traction group compared with 8 (8.0%) women in the spontaneous placental expulsion group. The differences in retained placenta and requirement for manual removal did not reach statistical significance ($p=0.054$ for both outcomes), as given in Table 4.

Table 4. Comparison of Retained Placenta and Need for Manual Removal Between the Study Groups

Outcome	Controlled Cord Traction (n=100)	Spontaneous Placental Expulsion (n=100)	p-value
Retained placenta, n (%)	2 (2.0)	8 (8.0)	0.054
No retained placenta, n (%)	98 (98.0)	92 (92.0)	
Manual removal required, n (%)	2 (2.0)	8 (8.0)	0.051

The mean postpartum hemoglobin level was 10.93 $\pm$ 0.91 g/dL in the controlled cord traction group and 10.71 $\pm$ 1.01 g/dL in the spontaneous placental expulsion group. The difference in postpartum hemoglobin levels was not statistically significant ($p=0.107$). The mean change in hemoglobin was -0.49 ± 0.48 g/dL in the controlled cord traction group and -0.67 ± 0.55 g/dL in the spontaneous placental expulsion group. The difference in change in hemoglobin between the groups was statistically significant ($p=0.015$), as given in Table 5.

Table 5. Comparison of Postpartum Hemoglobin and Change in Hemoglobin Between the Study Groups

Variable	Controlled Cord Traction (n=100)	Spontaneous Placental Expulsion (n=100)	p-value
Postpartum Hb (g/dL), mean $\pm$ SD	10.93 $\pm$ 0.91	10.71 $\pm$ 1.01	0.107
Change in Hb (g/dL), mean $\pm$ SD	-0.49 ± 0.48	-0.67 ± 0.55	0.015

Prolonged third stage of labor was observed in 3 (3.0%) women in the controlled cord traction group and 10 (10.0%) women in the spontaneous placental expulsion group, showing a statistically significant difference ($p=0.031$). PPH $\geq$ 500 mL occurred in 5 (5.0%) and 11 (11.0%) women, respectively, without a statistically significant difference ($p=0.123$). Retained placenta and manual removal of the placenta were each recorded in 2 (2.0%) women in the controlled cord traction group and 8 (8.0%) women in the spontaneous placental expulsion group, with $p=0.054$ for both outcomes. The mean decrease in hemoglobin was 0.49 $\pm$ 0.48 g/dL and 0.67 $\pm$ 0.55 g/dL in the respective groups, with a statistically significant difference ($p=0.015$), as given in Table 6.

Table 6. Comparison of Primary and Secondary Outcomes Between the Study Groups

Outcome	Controlled Cord Traction (n=100)	Spontaneous Placental Expulsion (n=100)	p-value
Prolonged third stage of labor (>15 min), n (%)	3 (3.0)	10 (10.0)	0.031
PPH $\geq$ 500 mL, n (%)	5 (5.0)	11 (11.0)	0.123
Retained placenta, n (%)	2 (2.0)	8 (8.0)	0.054

Manual removal of placenta, n (%)	2 (2.0)	8 (8.0)	0.054
Change in Hb (g/dL), mean $\pm$ SD	-0.49 ± 0.48	-0.67 ± 0.55	0.015

Placental expulsion within 5 minutes occurred in 48 (48.0%) women in the controlled cord traction group compared with 25 (25.0%) women in the spontaneous placental expulsion group. Expulsion within 6–10 minutes was observed in 43 (43.0%) and 47 (47.0%) women, respectively, while expulsion within 11–15 minutes occurred in 6 (6.0%) and 18 (18.0%) women, respectively. Placental expulsion taking more than 15 minutes occurred in 3 (3.0%) women in the controlled cord traction group and 10 (10.0%) women in the spontaneous placental expulsion group. The overall distribution of placental expulsion time differed significantly between the two groups ($p < 0.001$), as given in Table 7.

Table 7. Distribution of Participants According to Placental Expulsion Time

Placental expulsion time	Controlled Cord Traction (n=100)	Spontaneous Placental Expulsion (n=100)	p-value
≤ 5 minutes, n (%)	48 (48.0)	25 (25.0)	<0.001
6–10 minutes, n (%)	43 (43.0)	47 (47.0)	
11–15 minutes, n (%)	6 (6.0)	18 (18.0)	
>15 minutes, n (%)	3 (3.0)	10 (10.0)	

DISCUSSION

The third stage of labor begins after delivery of the baby and ends with complete expulsion of the placenta and membranes. Effective management of this stage is important to minimize maternal blood loss and prevent complications such as postpartum hemorrhage and retained placenta.^{9,10} Controlled cord traction facilitates placental delivery after signs of placental separation while counter-pressure is applied to the uterus.¹⁰ Spontaneous placental expulsion allows the placenta to separate and deliver naturally without traction on the umbilical cord. Although both approaches are used during vaginal delivery, their effects on the duration of the third stage and maternal blood loss may differ.^{11,12} Therefore, the present study was conducted to compare maternal outcomes following controlled cord traction and spontaneous placental expulsion.

The present study demonstrated that controlled cord traction (CCT) was associated with a significantly shorter third stage of labor and lower blood loss compared with spontaneous placental expulsion. The mean duration of the third stage was 6.84 ± 2.31 minutes in the CCT group compared with 9.72 ± 4.16 minutes in the spontaneous expulsion group ($p < 0.001$), while mean blood loss was 286.40 ± 112.65 mL versus 342.70 ± 145.32 mL, respectively ($p = 0.003$). These findings were broadly consistent with the results of Althabe et al. (2009), in which the median third-stage duration was substantially shorter with CCT than with hands-off management (4.0 vs 22.0 minutes, $p < 0.001$). Their median blood loss was also numerically lower with CCT (282.0 vs 310.2 mL), although this difference did not reach statistical significance (difference -28.2 mL, 95% CI -92.3 to 35.9 ; $p = 0.126$). The difference in blood loss in the present study was somewhat larger (56.3 mL), and unlike that pilot study, reached statistical significance, potentially reflecting differences in sample size, measurement procedures, population characteristics, and the definition and management of the third stage.¹⁵ The present findings were also closely aligned with the large multicentre TRACOR trial by Deneux-Tharaux et al. (2013), particularly regarding the duration of the third stage. A third stage exceeding 15 minutes occurred in only 3.0% of women receiving CCT compared with 10.0% receiving spontaneous placental expulsion in the present study, whereas the corresponding frequencies in TRACOR were 4.5% and 14.3%, respectively (RR 0.31, 95% CI 0.25–0.39). Thus, both studies demonstrated a consistent reduction in prolonged third-stage duration with CCT. The magnitude of the difference was also comparable, with an absolute reduction of 7.0 percentage points in the present study compared with 9.8 percentage points in TRACOR. However, the effect on PPH was less pronounced in the present study: PPH ≥ 500 mL occurred in 5.0% versus 11.0% ($p = 0.123$), whereas TRACOR reported 9.8% versus 10.3% (RR 0.95, 95% CI 0.79–1.15). Although the numerical frequency of PPH was lower with CCT in the present study, the difference was not statistically significant, suggesting that the reduction in duration of the third stage did not necessarily translate into a demonstrable reduction in clinically defined PPH in this sample. Manual removal was required in 2.0% versus 8.0% of women in the present study compared with 4.2% versus 6.1% in TRACOR (RR 0.69, 95% CI 0.53–0.90); the direction of effect was therefore similar, although the present difference did not reach statistical significance ($p = 0.054$).¹⁶

The findings of Gülmezoglu et al. (2012) provide an important context for interpreting the PPH results. In their large multicentre trial involving 11,861 women in the simplified/no-CCT group and 11,820 in the full/CCT group, the risk ratio for blood loss ≥ 1000 mL was 1.09 (95% CI 0.91–1.31), indicating no clear reduction in

severe hemorrhage from inclusion of CCT in the active-management package. Similarly, the present study did not demonstrate a statistically significant difference in PPH ≥ 500 mL despite a numerically lower frequency with CCT (5.0% vs 11.0%, $p=0.123$). This concordance suggests that although CCT may facilitate more rapid placental delivery and reduce measured blood loss, its effect on clinically significant hemorrhage may be smaller or less consistent. The occurrence of one uterine inversion in the CCT group in the large trial also emphasizes the importance of performing traction only after appropriate signs of placental separation and with adequate counter-traction, although no uterine inversion was reported in the present study.¹⁷

The findings were further supported by the meta-analysis of Du et al. (2014), which synthesized five randomized controlled trials involving 30,532 women. The pooled evidence showed no significant reduction in severe PPH with CCT (RR 0.91, 95% CI 0.77–1.08), but demonstrated a modest reduction in PPH ≥ 500 mL (RR 0.93, 95% CI 0.87–0.99; NNT 111), manual removal of the placenta (RR 0.70, 95% CI 0.58–0.84), and duration of the third stage (mean difference -3.20 minutes, 95% CI -3.21 to -3.19). The present results followed the same overall pattern: CCT produced a shorter third stage (6.84 vs 9.72 minutes) and lower mean blood loss (286.40 vs 342.70 mL), while the differences in PPH and manual removal were not statistically significant. The relatively small sample of 200 women in the present study may partly explain why outcomes with relatively low event frequencies did not achieve statistical significance despite numerical differences.¹⁸

The results were also comparable with those reported by Tajasar et al. (2024), who observed a significantly shorter mean third stage with the intervention, 5.25 ± 0.80 minutes compared with 7.94 ± 1.03 minutes ($p=0.0001$). The magnitude of the difference in that study was 2.69 minutes, compared with 2.88 minutes in the present study, demonstrating a remarkably similar absolute reduction in third-stage duration. Furthermore, the reported consistency across age, gestational age, parity, and BMI supports the possibility that the effect on placental delivery time is relatively robust across maternal characteristics. Nevertheless, differences in the intervention terminology and study protocols should be considered when directly comparing the two populations.¹⁹

Javed et al. (2026) evaluated a different aspect of third-stage management by comparing routes of oxytocin administration rather than CCT with spontaneous placental expulsion. Their median third-stage duration was 2.5 minutes (IQR 2.1–3.2) with intramuscular oxytocin compared with 3.4 minutes (IQR 3.0–3.8) with intravenous oxytocin ($p<0.001$), while PPH and other maternal outcomes were statistically similar between groups. Although the intervention differs from that of the present study, the findings reinforce the observation that the duration of placental delivery can vary according to the method of third-stage management, whereas differences in PPH may not necessarily parallel differences in delivery time. The lower absolute third-stage durations reported by Javed et al. may reflect differences in oxytocin administration, timing, population characteristics, or outcome measurement rather than a direct difference attributable to CCT.²⁰ Maheswari et al. (2026) addressed spontaneous placental separation versus manual removal during cesarean section and therefore differed substantially from the vaginal-delivery setting of the present study. Across 20 studies included in their qualitative synthesis, spontaneous separation was generally associated with lower blood loss and a smaller postoperative hemoglobin decline, while manual removal sometimes shortened placental delivery but was accompanied by increased bleeding and postoperative complications. These findings provide indirect support for the importance of minimizing unnecessary manual manipulation of the placenta; however, they cannot be directly equated with CCT because controlled traction is a less invasive technique performed during vaginal placental delivery and is fundamentally different from manual intrauterine removal during cesarean section. The difference in operative setting and intervention therefore limits direct applicability of these findings to the present study.²¹

Shaheen et al. (2014) similarly investigated placental management during cesarean section and reported a greater mean hemoglobin decline with manual removal than with spontaneous removal by umbilical cord traction, 1.25 ± 0.52 versus 1.86 ± 0.66 g/dL, with a significant difference in the proportion experiencing a substantial hemoglobin drop (11.9% vs 28.57%, $p=0.02$). Although their study population and operative circumstances were different, the direction of their findings is consistent with the present observation that less blood loss was associated with the non-manual approach to placental delivery. In the present study, the mean hemoglobin decline was -0.49 ± 0.48 g/dL with CCT compared with -0.67 ± 0.55 g/dL with spontaneous placental expulsion ($p=0.015$). Taken together, these findings suggest that the method and degree of placental manipulation may influence maternal blood loss and subsequent hemoglobin change, although differences in mode of delivery and intervention prevent direct quantitative comparison. Overall, the present study supports the established finding that CCT facilitates faster placental delivery and may reduce measured blood loss, while its effect on clinically significant PPH and retained placenta appears less consistent and may require larger adequately powered studies to establish statistically significant differences.²²

STUDY LIMITATIONS

The study was conducted at a single tertiary-care hospital, which may limit the generalizability of the findings to other healthcare settings. The relatively short study duration and limited sample size may have reduced the ability to detect differences in uncommon complications. Blinding of the birth attendants was not possible because the interventions involved visibly different methods of placental delivery. Long-term maternal outcomes beyond the immediate postpartum period were not assessed.

CONCLUSION

Controlled cord traction was associated with a shorter duration of the third stage of labor and lower mean blood loss than spontaneous placental expulsion. The frequencies of postpartum hemorrhage and retained placenta did not differ significantly between the two groups. The findings provided comparative evidence regarding the maternal outcomes of the two approaches during the third stage of labor.

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