Clinical Medicine and Health Research Journal (CMHRJ)
Volume 03, Issue 05, September - October, 2023
Page No. 530-533,

Research Article

Comparations Controlled Cord Traction and Manual Removal of Placenta in Caesarean Section: Prospective Study of Somali Pregnant Women

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Received: 03 August, 2023 Accepted: 04 September, 2023 Published: 09 September 2023

Abstract:

Aim: This study sought to examine the intraoperative and postoperative outcomes of Controlled cord traction and manual removal of the placenta in the third stage of labour during the caesarean section.

Methods: We prospectively enrolled pregnancies who were admitted to the clinic of the Department of obstetrics and Gynaecology for caesarean section (Pfannenstiel method) in addition to providing sociodemographic data (age, body mass index) and clinical data (haemoglobin, total operative time, removed placenta total time, postpartum haemorrhage, need to blood transfusion, hospital stay, intensive care unit (ICU) admission, postoperative eating and drinking time, and intrabdominal blood).

Results: Of 196 participating women, 98 performed controlled cord traction removal of the placenta, and 98 performed manual removal. The controlled cord traction removal of the placenta group and the manual removal of the placenta group had similar blood loss (haemoglobin drop) and postpartum haemorrhage ($p>0.05$). In the controlled cord traction removal of placenta group, significant intra-operative findings were shorter removal of placenta time (18.7±10.6 vs 28.6±13.1 second, $p=0.0001$), shorter total operative time (36.3±10.7 vs 41.8±11.4, $p=0.003$) and lower prevalence of presenting intrabdominal blood (12.2% vs 26.7%, $p=0.021$). Significant postoperative findings were earlier eating time (15.0±7.3 vs 19.6±14.4 hours, $p=0.011$) and lower incidence of endometritis (1% vs 4.1%, $p=0.042$) compared with the manual removal of placenta.

Conclusion: The umbilical cord traction maneuverer for the placenta delivery had more advantages than the manual removal maneuverer. This technique should be recommended during the third stage of labour during the caesarean section.

Keywords: Caesarean section, umbilical cord traction of placenta, manual removal of placenta, Somalia.

Introduction

Caesarean section (CS) is a life-saving operation in case of certain complications during pregnancy and labour. Caesarean section rates have steadily increased in developing and developed countries in recent years. Life-saving surgery does not mean that it is risk-free(1, 2).

Despite advances in modern surgical equipment and postoperative care, life-threatening risks such as bleeding, infection and anaemia persist. Major obstetric haemorrhage and infection, resulting in hysterectomy, intensive care unit (ICU) admission and maternal death, are of particular concern in underdeveloped and developing countries(1, 2).

The method of placental removal is an important factor in determining the outcomes during C.S.(1, 2). The method of placental removal is one such procedure that can affect outcomes of caesarean delivery, such as the amount of bleeding during intraoperative and postoperative, the time of operation, and the occurrence of postoperative endometritis(1, 2). However, the ideal method of placental removal during C.S. is still a controversial issue. The choice is mainly based on the surgeon's preference. There are 3 different placenta removal methods; controlled cord traction (Brandt-Andrews method)(3, 4) or manual or spontaneous removal of placenta at caesarean section(5).

This study sought to examine the intraoperative and postoperative outcomes of Controlled cord traction and manual removal of the placenta in the third stage of labour during the C.S.

Methods

Study design and participants

This prospective study included data on 196 (98 for controlled cord traction and 98 for manual removal of placenta for pregnant) women who had been admitted to the Department of obstetrics of Mogadishu Somali Turkey Training and Research Hospital in Mogadishu, the capital city of Somalia, between July 6 and December 1, 2022. All patients underwent Pfannenstiel incision. Data included maternal age, gravida, parity, gestational week, body mass index (BMI), haemoglobin, birth weight, APGAR scores, total operative time, removed placenta total time postpartum haemorrhage, need to blood transfusion, hospital stay, intensive care unit (ICU) admission,

postoperative eating and drinking time, and intrabdominal blood. Haemoglobin was measured in all patients on the day of surgery and within 6 hours after surgery.

Inclusion criteria were primary or repeat elective C.S., single gestation, Pfannenstiel incision, controlled cord traction or manual removal of placenta, manual placenta or spontaneous separation. Exclusion criteria were spontaneous separation placenta, moderate and severe anaemia, coagulation defects, multi-foetal gestation, pregnancy-induced hypertension, the mixture of the manual placenta and spontaneous separation, uterine fibroid and anomalies, placental abruption, and placenta previa). Any participants with abnormal placental adhesions, tears or extensions into the lower uterine segment, or uterine artery injury that might affect haemorrhage. The site of attachment of all the placentas in this study was in the upper uterine segment.

Data processing and analysis

Data were collected using a structured format, including all relevant clinical information and were processed using the Statistical Package for Social Sciences (SPSS) version 28 (IBM Corp., Armonk, N.Y.; USA). Quantitative data were expressed as means with standard deviation (S.D.), median, minimum, and maximum, and qualitative data as frequencies and percentages. Homogeneity was checked using Levene's test, with a p-value of >0.05 considered in favour of homogeneity. The Shapiro-Wilk normality test was used to check whether continuous variables were normally distributed.

For pairwise comparisons, numerical variables were compared using the independent t-test if normally distributed. Nominal variables were analysed with Pearson's chi-squared test. A p-value of < 0.05 was accepted as statistically significant. All variables were expressed with 95% confidence intervals (CI)

Results

The sociodemographic, clinical and obstetrics characteristics of the study participants are presented in Table 1. The mean age was 28.4±5.3 years among the controlled cord traction removal of the placenta group and 27.4±4.5 in the manual removal of the placenta group. The corresponding figures for median parity were 2 in the spontaneous delivery of the placenta and 2 in the manual removal of the placenta group. Deliveries occurred at a mean gestational age of 38.1±2.6 weeks in the controlled cord traction removal of the placenta group and 38.1±3.7 in the manual removal of the placenta group (p>0.05). The mean birth weight was 3,045±728 g in the controlled cord traction removal of the placenta group and 3,050±689 g in the manual removal of the placenta group (p>0.05). The controlled cord traction removal of the placenta group and the manual removal of the placenta group had similar blood loss (haemoglobin drop) and postpartum haemorrhage (p>0.05).

The controlled cord traction removal of the placenta group significantly differed from the manual removal of the placenta with respect to two main domains of study: intra-operative and postoperative duration. Significant intra-operative findings were shorter removal of placenta time (18.7±10.6 vs 28.6±13.1 second, p=0.0001), shorter total operative time (36.3±10.7 vs 41.8±11.4, p=0.003) and lower prevalence of presenting intrabdominal blood (12.2% vs 26.7%, p=0.021).Significant postoperative findings were earlier eating time (15.0±7.3 vs 19.6±14.4 hours, p=0.011), earlier gas output time (11.8±12.2 vs 16.4±13.7, p=0.037), and lower incidence of endometritis (1% vs 4.1%, p=0.042) (Table 1)

Table 1 The sociodemographic, clinical and obstetrics characteristics of the study participants

Variables	**Controlled cord traction removal of placenta (n=98)**	**Manual removal of placenta (n=98)**	**P**
Age, mean±SD	28.4±5.3	27.4±4.5	0.215
Parity, median (min-max)	3 (1-14)	2 (1-9)	0.509
BMI (kg/m^2), mean±SD	31.86±4.12	30.92±4.27	0.191
Delivery weeks, mean±SD	38.1±2.6	38.1±3.7	0.960
Birth weight (g), mean±SD	3,045±728	3,050±689	0.970
APGAR score, mean±SD			
1. minute	7.4±1.9	7.2±2.4	0.739
5. minute	8.5±2.2	7.9±3.1	0.216
Intraoperative progress			
Removal of placenta total time (seconds), mean±SD	18.7±10.6	28.6±13.1	**0.0001**
Abdominal cleaning, n(%)	12 (12.2)	26 (26.7)	**0.021**
Total operative time (min), mean±SD	36.3±10.7	41.8±11.4	**0.003**
Section side length (cm), mean±SD	16.8±2.7	17.5±1.9	0.094
Postoperative progress			

Gas output time (hours), mean±SD	11.8±12.2	16.4±13.7	**0.037**
Faeces output time (hours), mean±SD	22.7±10.5	25.3±12.7	0.340
eating time (hours), mean±SD	15.0±7.3	19.6±14.4	0.011
Drinking time (hours), mean±SD	5.5±3.8	5.3±3.8	0.695
Hb difference (post-preoperative) mean±SD	-.99±1.26	-.95±1.40	0.848
Postpartum haemorrhage, n(%)	2 (2)	4 (4.1)	0.061
Need to blood transfusion at hospital, n (%)	4 (4.1)	7 (11.7)	0.072
Endometritis, n(%)	1 (1.0)	4 (4.1)	0.042
Hospital stay, mean±SD	2.1±0.2	2.2±0.2	0.972
ICU admission	4(4.1)	5(5.1)	0.780
Maternal death at hospital	0(0)	0(0)	

*The Independent t-test; **Pearson's chi-squared test: SD:standard deviation; min:minimum;max:maximum; %:percentage; n:number.

Discussion

In our study, we evaluated controlled cord traction (Brandt-Andrews method) versus the manual removal of the placenta at the caesarean section on intra- and postoperative outcomes.

Previous studies on the placental removal technique mainly addressed compared manual placental removal with spontaneous placental removal at caesarean section(1, 2, 4). To our knowledge, there were limited studies in the literature on this subject(6, 7), with none from Somalia.

Similar findings were reported addressing the outcomes of the umbilical cord traction were better than the manual removal(7). Intapibool et al. found a significantly shorter time of the operation and a significant decrease in haemoglobin (9). In another study, controlled cord traction removal of the placenta was significantly associated with lower incidence of endometritis, less decreased blood loss and shorter hospital stay(7) . In a similar study, controlled cord traction removal of the placenta was found to have significantly less decreased blood loss and less incidence of endometritis compared with manual removal (10). Although the authors found similar duration operation time, in our study, the duration operation time in controlled cord traction removal of the placenta was shorter. Similarly, in our study, controlled cord traction removal of the placenta had a lower incidence of endometritis. Of note, none of the studies mentioned above had comparisons between eating time and cleaning intrabdominal blood.

Our findings indicate three interesting features and rationale for controlled cord traction removal of the placenta (Table 1). First, because we removed the placenta with traction, less placenta was retained and bleeding flowed from the uterine to the abdomen. And therefore, less abdominal cleaning was performed, and as a result, patients began to eat earlier as a result of earlier gas and stool. Second, removal of the placenta by traction was suitable for normal birth physiology, and therefore, fewer placenta fragments remained in the uterus, which resulted in a more special treatment without endometriosis. Third, it took less operation time as a result of all these.

Strengths and Limitations

Limitations to our work included variability in the skill of obstetricians performing the C.S. Even though all obstetricians performing the procedure had the same training and hospital ranking, it's challenging to quantify talent and speed. It's impossible to have one obstetrician perform all these operations to reduce inter-operator skill variability.

Conclusion

The umbilical cord traction maneuverer for the delivery of the placenta had more advantages than the manual removal maneuverer. This technique should be a recommendation during the third stage of labour during the caesarean section. More studies are needed to address the umbilical cord traction technique, particularly in the third stage of labour during the caesarean section.

Ethics approval and consent to participate

The study was approved by the Ethics and Research Committee (Permission number: MSTH/10901/04.07.2022/637). The study was performed in accordance with the principles and guidelines of the Declaration of Helsinki. All participants were informed about the study and gave consent to publication of the results. Analysis and reporting of the results are in compliance with the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) checklist(8).

Data Availability

Data will be available upon request from corresponding author.

Conflicts of Interest

No conflicting interest exists.

Funding Statement

None

Abbreviations

STROBE: Strengthening the Reporting of Observational Studies in Epidemiology; C.S.: Caesarean section; ICU: Intensive care unit; BMI: Body mass index; CI: Confidence interval; SPSS: Statistical package for social science; SD: Standard deviation; USA: United States of America.

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