

Original article

Delayed Clamping of Umbilical Cord and Risk of Intraventricular Hemorrhage in Preterm Newborns at Souq Alkamees Hospital, Libya

Khalifa Abu Faris , Belkasem Abdurahman , Abdul Aziz Abu Ras 

Faculty of Medicine, Al-Merqeb University, Alkhoms, Libya

Corresponding email Abueliasyons47@gmail.com

Abstract

Delayed umbilical cord clamping seems advantageous for both preterm and term neonates. Delayed cord clamping (DCC) enhances neurological outcomes in preterm newborns by decreasing the frequency of intraventricular hemorrhage (IVH). In term newborns, postponing umbilical cord clamping elevates hemoglobin concentrations at delivery and enhances iron reserves over the initial months of life. In preterm babies, delayed umbilical cord clamping correlates with substantial newborn advantages, such as enhanced transitional circulation, improved red blood cell volume establishment, diminished necessity for blood transfusions, and diminished occurrences of necrotizing enterocolitis & intraventricular hemorrhage. The goal of this research was to determine the delayed clamping of the umbilical cord and the risk of Intraventricular hemorrhage in preterm infants. The study was conducted at Souq Alkamees Hospital, Libya, with 182 cases during the study period, October 2023 to September, 2024. In this study, male gender is 50.54%, and female is 49.45%. The gestational age is denoted in weeks, and from 24 weeks to 27 weeks is 19.78%, and from 28 weeks to 31 weeks is 80.21%. The birth weight of the babies varies from 2500 to 4000 grams. The weights 2500 to 3000 g is 16.48%, 3000 to 3500 g is 52.74%, and 3500 to 4000 g is 30.76%. In this table, the time between delivery and cord clamping is noted. Below or equal to 10 seconds is 5.49%, 11 to 30 seconds is 6.04%, 31 to 59 seconds is 42.85%, and greater than 60 seconds is 46.11%. The infant death rate in vaginal deliveries is 1.09%, and in cesarean deliveries are 0.54%. The grade of hemorrhage 1 is 3.29%, 2 is 1.09%, 3 is 0.54%, and 4 is 1.64%, respectively.

Keywords. DCC, Preterm neonates, IVH, Libya.

Introduction

The survival rate of preterm newborns has risen in recent decades. This was linked to the increasing significance of illnesses in preterm newborns [1]. The potential for brain injury in these infants is particularly significant. Notwithstanding numerous advancements in service provision for these children, brain injuries resulting from bleeding in the germinal matrix and Intraventricular bleeding are especially severe due to their enduring neurological consequences [2, 3]. Cord clamping in premature newborns, owing to reduced blood volume, exerts hemodynamic influences. This influences the incidence rate of problems, including anemia, IVH, the necessity for blood transfusions, the requirement for phototherapy, and necrotizing enterocolitis (NEC) [4]. The capacity for DCC may differ between institutions and environments; decisions in such cases are optimally determined by the team responsible for the mother-infant dyad [5].

This influences the risk of consequences including anemia, IVH, the requirement for blood transfusion, the necessity for NEC, and phototherapy [6, 7, 8]. IVH is a major complication whose frequency rate was stated to be decreased by DCC [9]. Conversely, certain data indicate a heightened occurrence of IVH associated with delayed cord clamping [10]. The protective influences of DCC in movement disorders, particularly in male neonates, are among its long-term influences. Some investigations have indicated no change in the frequency of IVH between the two approaches [11,12]. According to a theory, the limited blood volume in preterm newborns necessitates a higher frequency of blood transfusions, which can be mitigated by postponing umbilical cord clamping for thirty to sixty seconds, hence increasing the incidence of intraventricular hemorrhage [13]. Nonetheless, this notion has been dismissed by certain investigators, who haven't identified any correlation among hematocrit, the necessity for blood transfusion, and the severity of intraventricular hemorrhage [14]. Further research is required in this domain due to the discrepancies in findings about the diminished frequency of IVH, the absence of proof for informed decision-making, and the method's simplicity, cheap cost, and potential efficacy in reducing IVH occurrence.

Methods

Study Place

This retrospective study was conducted in the Pediatric Department, Souq Alkamees Hospital, Alkhoms, Libya, with 182 cases.

Study Period

The research period has been determined to be 12 months from October 2023 to September 2024.

Sampling Procedure

Prenatal and delivery information was extracted from the maternal records. The timing of cord clamping, infant placement, Apgar scores, and the date and time of birth have been recorded in the labor unit. Data

on infants have been gathered following twelve hours of age and subsequent to discharge BPD was defined as the need for oxygen therapy at thirty-six weeks' postmenstrual age or death prior to this time. Suspected NEC was characterized as a clinical impression when the neonatology team requested a radiograph to exclude NEC, and the newborn had been rendered NPO (nothing by mouth) for a minimum of twenty-four hours. Cranial ultrasound (CUS) assessments employed the Papile grading system: grade 1 denotes a germinal matrix hemorrhage; grade 2 indicates extension into the lateral ventricle with blood occupying below fifty percent of the ventricular area; grade 3 signifies intraventricular hemorrhage with distension or dilation of the lateral ventricles containing blood; and grade 4 represents IVH with parenchymal involvement.

Statistical analysis

The data have been examined and processed with the SPSS 22.0 statistical software (IBM Corp. USA). Group comparisons have been conducted utilizing the chi-squared test. Continuous parameters, including age, body weight, and gestational age, have been presented as the mean \pm SD. The Independent Samples t-test has been utilized for mean comparison. A P-value of less than 0.05 has been deemed to signify statistical significance.

Results and Discussion

DCC enhances neurological results in preterm newborns by decreasing the frequency of IVH. The underlying mechanism of this neuroprotective action remains unidentified. Babies born at below 28 weeks' gestation have been enrolled for longitudinal observation. All newborns experienced 72 hours of synchronized near-infrared spectroscopy (NIRS) and mean arterial blood pressure (MABP) monitoring within twenty-four hours of birth [15]. Our study was conducted in the Department of Pediatrics, Souq Alkamees Hospital, Libya, with 182 patients during the study period October, 2023 to September 2024.

Table 1 is summarized with the distribution of neonatal demographic characteristics of delayed cord clamping, in this male gender with 50.54% and female is 49.45%. The gestational age is denoted in weeks, from 24 weeks to 27 weeks is 19.78%, and from 28 weeks to 31 weeks is 80.21%. The birth weight of the babies varies from 2500 to 4000 grams. The weight 2500 to 3000 g is 16.48%, 3000 to 3500 g is 52.74%, and 3500 to 4000 g is 30.76%. The P-Value is 0.0721, respectively, and the data collected was significant.

Table 1. Distribution of neonatal demographic characteristics of delayed cord clamping

Parameter	No of cases (n=182)	Mean	P-Value
Gender			
Male	92	50.54	
Female	90	49.45	
Gestational age, week			
24 weeks to 27 weeks	36	19.78	
28 weeks to 31 weeks	146	80.21	
Birth weight, grams			
2500 to 3000 g	30	16.48	
3000 to 3500 g	96	52.74	
3500 to 4000 g	56	30.76	
Mode of delivery			
Cesarean	11	6.04	
Vaginal	171	93.95	

(% calculated from 182 cases)

Table 2 is tabulated with the distribution of treatment adherence of delayed cord clamping. In this table time between delivery and cord clamping is noted. Below or equal to 10 sec is 5.49%, 11 to 30 sec is 6.04%, 31 to 59 sec is 42.85%, and greater than 60 sec is 46.11%. The P-Value is 0.0039, respectively, and the data is significant.

Table 2. Distribution of treatment adherence of DCC

Parameter	No of cases (n=182)	Mean	P-Value
Time between delivery and cord clamping			
≤ 10 sec	10	5.49	
11-30 sec	11	6.04	
31-59 sec	78	42.85	
≥ 60 sec	83	46.11	

(% calculated from 182 cases)

Table 3 is shown with outcomes of delayed cord clamping, the infant death rate in vaginal deliveries is 1.09%, and in cesarean deliveries are 0.54%. The grade of hemorrhage 1 is 3.29%, 2 is 1.09%, 3 is 0.54%, and 4 is 1.64%. The blood loss among the patients is 13.18%. The P-Value is 0.0933, respectively. The p-value is higher than 0.05 and not significant.

Table 3. Outcomes of delayed cord clamping

Outcomes	No of cases (n=182)	Mean	P-Value
Infant death			
Vaginal deliveries	2	1.09	
Cesarean deliveries	1	0.54	
Grade of Hemorrhage			
1	6	3.29	
2	2	1.09	
3	1	0.54	
4	3	1.64	
Blood loss			
Yes	24	13.18	
No	158	86.81	

(% calculated from 182 cases)

Conclusion

Both preterm and term infants seem to benefit from delayed umbilical cord clamping; thus, it is advisable to delay clamping for a minimum of thirty to sixty seconds in these infants, unless immediate clamping is warranted due to maternal or neonatal indications [16]. In term newborns, postponing umbilical cord clamping elevates hemoglobin concentration at delivery and enhances iron reserves during the initial months of life, perhaps benefiting developmental outcomes [17]. A minor rise in jaundice necessitating phototherapy is observed in term newborns subjected to delayed umbilical cord clamping. Consequently, obstetrician-gynecologists and other obstetric care providers implementing DCC in term babies must establish protocols to detect and address neonatal jaundice.

Conflict of interest. Nil

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