International Journal of Contemporary Pediatrics
Hassan M et al. Int J Contemp Pediatr. 2019 May;6(3):1251-1254
http://www.ijpediatrics.com
pISSN 2349-3283 | eISSN 2349-3291

DOI: http://dx.doi.org/10.18203/2349-3291.ijcp20192022

Original Research Article

Immediate effects of clamping of the umbilical cord on the newborns

Muhammad Hassan, Adarsh E.*, Sahana Manjunath, Shivtej N., Archana D. V., Vidhi Meta, Spoorthi S.

Department of Pediatrics, Rajarajeshwari Medical College Hospital, Bangalore, Karnataka, India

Received: 20 February 2019
Accepted: 01 April 2019

***Correspondence:**
Dr. Adarsh E,
E-mail: dradarshe@gmail.com

ABSTRACT

Background: The optimal timing of cord clamping has been a controversial issue for decades. Most practitioners in developing countries clamp and cut the cord immediately after birth and this takes place during the third stage of labour. World Health Organization advises late cord clamping, however there is a debate on the optimal time for cord clamping. Delayed umbilical cord clamping appears to be beneficial for term and preterm infants.
Methods: This observational study was undertaken at Rajarajeswari Medical College and Hospital, Bangalore, Karnataka, India from June 2018 to January 2019.
Results: Total 100 neonates were studied of which 48 were females (48%) and 52 were males (52%). 76 babies (76%) were 3 day old in this study and 24 babies were (24%) 4 day old during the study period. 92 babies (92%) didn't receive phototherapy in this study and 8 babies (8%) required phototherapy during the study period. No babies were polycythemic during this study period. Mean TB was 11.832 whereas mean DB was 0.5. Mean HCT was 56.332 and mean HB was 18.3002.
Conclusions: Present study concluded that there are various advantages if authors practiced delayed cord clamping including higher levels of haemoglobin and haematocrit levels.

Keywords: Anemia, Delayed cord clamping

INTRODUCTION

The timing of umbilical cord clamping during the third stage of labour has been a point of contention for many years. In spite of that, the optimal timing of cord clamping has been a controversial issue for decades.[1] There are no formal practice guidelines, but most practitioners in developing countries clamp and cut the cord immediately after birth, and this takes place during the third stage of labour.[2] World Health Organization advises late cord clamping, however there is a debate on the optimal time for cord clamping.[3] If the cord clamping is deferred more than 60 seconds, blood flow between the baby and placenta continues and is usually completed by 120 seconds and named as placental transfusion. This allows the transfusion of 80-100 ml of blood which constitutes about one third or a quarter of the neonate's total blood volume.[4]

At the time of birth, the infant is still attached to the mother via the umbilical cord, which is part of the placenta. The infant is usually separated from the placenta by clamping the cord. This clamping is one part of the third stage of labour (the time from birth of the baby until delivery of the placenta) and the timing can vary according to clinical policy and practice. Delayed umbilical cord clamping appears to be beneficial for term and preterm infants. In term infants, delayed umbilical

cord clamping increases hemoglobin levels at birth and improves iron stores in the first several months of life, which may have a favourable effect on developmental outcomes. In preterm infants, rates of intraventricular haemorrhage and necrotizing enterocolitis are lower and fewer newborns require transfusion when delayed umbilical cord clamping is employed. This growing body of evidence has led a number of professional organizations to recommend delayed umbilical cord clamping in term and preterm infants.[5,6]

The neonatal benefits associated with delayed cord clamping increased placental transfusion include higher haemoglobin concentrations, improved iron stores and lesser incidence of anaemia later in infancy, higher red blood cell flow to vital organs, better cardiopulmonary adaptation, and increased duration of early breastfeeding.[7-11] Other studies suggests delayed cord clamping confers improved iron status in infants up to six months post birth.[8,11,12]

Delayed cord clamping has been linked to an increase in the incidence of jaundice which, in severe cases, could have longer term effects on the health and development of the infant.[7] A delay in time before clamping the umbilical cord in healthy term infants appears be less crucial as the cord ceases pulsation within the first two minutes of birth in the majority of cases.

METHODS

This observational study was undertaken at Rajarajeswari Medical College and Hospital, Bangalore, Karnataka, India. This study was conducted from June 2018 to January 2019.

After getting approval from institutional ethical committee, written informed consent was obtained from the parents, included 100 pregnant women starting from ≥37 weeks of gestational age who's pricked for blood investigations on day 3 of life were included in the study.

A detailed history was taken including name and age of the baby, sex of baby and phototherapy was given or not. Results were analyzed by simple statistical techniques recording number and percentage of cases. Student's t-test was applied and p <0.05 was considered significant.

Inclusion criteria

Babies born at and above 37 completed weeks of gestation.

Exclusion criteria

- Congenital anomalies,
- Obstetric complications (antepartum haemorrhage, preeclampsia, etc.).
- Twin's pregnancy
- Preterm delivery (<37 weeks)
- Prolonged rupture of membranes (>18 hours).

RESULTS

In this study, out of 100 babies, 48 were females which constituted 48% and 52 were males which was 52% of the study population (Table 1).

Table 1: Frequency table of sex distribution.

Sex		Frequency	Percent
Valid	Female	48	48.0
	Male	52	52.0
	Total	100	100.0

Table 2 explains that in this study of 100 neonates, 76 babies (76%) were 3 day old in this study and 24 babies were (24%) 4 day old during the study period.

Table 2: Day of life distribution.

Day of life		Frequency	Percent
Valid	3	76	76.0
	4	24	24.0
	Total	100	100.0

Table 3: Frequency table of requirement of phototherapy.

Phototherapy		Frequency	Percent
Valid	No	92	92.0
	Yes	8	8.0
	Total	100	100.0

Table 3 explains out of 100 babies in the study group, 92 babies (92%) didn't receive phototherapy in this study and 8 babies (8%) required phototherapy during the study period.

Table 4: Frequency table diagnosis of polycythemia.

Polycythemia		Frequency	Percent
Valid	No	100	100.0

Table 4 explains that no babies were polycythemic during this study period. The comparison between the days 3 and 4 in DB shows no statistical significance with P=0.465 and mean±SD as 0.558±0.16 and 0.517±0.19 respectively with standard error mean on day 3 as 0.0260 and with standard error mean on day 4 as 0.0562.

The comparison between the day 3 and day 4 (Table 5) in TB shows statistical significance with P=0.004 and mean±SD as 11.35±1.7 with standard error mean 0.2864 on day 3 and 13.3±2.7 with standard error mean 0.7798 on day 4 respectively. The comparison between the days 3 and 4 in DB shows no statistical significance with P=0.465 and mean±SD as 0.558±0.16 and 0.517±0.19

respectively with standard error mean on day 3 as 0.0260 and with standard error mean on day 4 as 0.0562.

Table 5: Group statistics with t-test.

Blood indices	Day of life	N	Mean	SD	Std. error mean
TB	3	76	11.350	1.7655	0.2864
	4	24	13.358	2.7013	0.7798
DB	3	76	0.558	0.1605	0.0260
	4	24	0.517	0.1946	0.0562
HB	3	76	18.2003	0.96308	0.15623
	4	24	18.6167	1.64363	0.47447
HCT	3	76	55.329	3.0949	0.5021
	4	24	55.342	4.1862	1.2085

Table 6: Phototherapy vs day of life.

Phototherapy			Day of life		Total
			3	4	
Phototherapy	No	Count	74	18	92
		%	97%	75%	92%
	Yes	Count	2	6	8
		%	3%	25%	8%
Total		Count	76	24	100
		%	100%	100%	100%

Mean HB on day 3 and day 4 neonates were 18.2003 and 18.6167 with standard deviation 0.96308 and 1.64363 and standard error mean 0.15623 and 0.47447 respectively. Mean HCT on day 3 and day 4 neonates were 55.329 and 55.342 with standard deviation 3.0949 and 4.1862 and standard error mean 0.5021 and 1.2085 respectively.

Table 6 explains the relationship between phototherapy vs day of life. 2 babies received phototherapy and 74 babies didn't receive phototherapy out of 76 babies on day 3 of life (3% of study population) compared to 6 babies out of 24 babies (25%) received phototherapy on day 4 of life.

Table 7 explains descriptive statistics of variables- TB, DB, HB and HCT of the 100 babies in this study population. Mean TB was 11.832 , maximum and minimum TB were 18 and 6.2 respectively with standard deviation 2.1778. Mean DB was 0.548, maximum and minimum DB were 0.8 and 0.2 respectively with standard deviation 0.1681. Mean HB was 18.3002, maximum and minimum HB were 20 and 17 respectively with standard deviation 1.15720. Mean HCT was 56.332, maximum and minimum HCT were 59.1 and 50 respectively with standard deviation 3.3417.

Table 7: Descriptive statistics of variables.

Blood indices	N	Minimum	Maximum	Mean	SD
TB	100	6.2	18.0	11.832	2.1778
DB	100	0.2	0.8	0.548	0.1681
HB	100	17.00	20.00	18.3002	1.15720
HCT	100	50.0	59.1	56.332	3.3417
Valid N (listwise)	100				

DISCUSSION

This observational study was undertaken at Rajarajeswari Medical College and Hospital, Bangalore, Karnataka, India from June 2018 to January 2019. Total of 100 neonates were included in the study of which 48 was females and 52 were males. 76 babies in the study group was 3 days old and 24 babies were 4 days old. 8 babies which constituted 8% of the study group received phototherapy and there was no statistical significance.

None of the babies were polycythemic in this study group. This suggested that there is no increased incidence of polycythemia in relation to delayed cord clamping. The mean TB/DB was 11.35 and 0.558 on day 3 of life and mean TB/DB was 13.358 and 0.517 on day 4 of life. This suggests that there was no significant increase in TB/DB on day 3 and day 4 of life. Mean HB and HCT on day 3 was 18.2003 and 55.329 and mean HB and HCT on day 4 was 18.616 and 55.342. Mean HCT was 56.332 and mean HB was 18.3002. Mean HB/HCT was higher in this study group compared to other studies.[13] This suggest better HB and HCT levels on day 3 and day 4 of life if umbilical cord is clamped at 1 minute of life, i.e., delayed cord clamping.

CONCLUSION

Present study concluded that there are various advantages if authors practiced delayed cord clamping.

Advantages includes higher levels of haemoglobin and haematocrit levels. There was no increased incidence of polycythemia. Serum ferritin levels and iron levels couldn't be measured in this study which was more specific for iron stores in the body.

Funding: No funding sources

Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Mercer JS, Skovgaard RL. Neonatal transitional physiology. J Perinatal Neonatal Nurse. 2002;15:56-75.
2. McDonald S. Management of the third stage of labor. J Midwifery and Women's Health. 2007;52:254-61.
3. World Health Organization. Care in normal birth: a practical guide. Switzerland: WHO Safe Motherhood Technical Working Group: Geneva; 1996: 32-3.
4. Farrar D, Airey R, Law G, Tuffnell D, Cattle B, Duley L. Measuring placental transfusion for term births: weighing babies with cord intact. BJOG. 2011;118:70-5.
5. Rabe H, Diaz-Rossello JL, Duley L, Dowswell T. Effect of timing of umbilical cord clamping and other strategies to influence placental transfusion at preterm birth on maternal and infant outcomes. Cochrane Database Sys Rev. 2012;(8).
6. McDonald SJ, Middleton P, Dowswell T, Morris PS. Cochrane in context: effect of timing of umbilical cord clamping in term infants on maternal and neonatal outcomes. Evidence-Based Child Health: a Cochrane Rev J. 2014;9(2):398-400.
7. Prendiville W, Elbourne D. Care during the third stage of labour. In: Chalmers I, Enkin M, Keirse MJNC eds. Effective Care in Pregnancy and Childbirth. Oxford: Oxford University Press; 1989: 1145-1169.
8. Chaparro CM, Fornes R, Neufeld LM, Alavez GT, Cedillo RE, Dewey KG. Early umbilical cord clamping contributes to elevated blood lead levels among infants with higher lead exposure. J Pediatrics. 2007;151:506-12.
9. Hutton EK, Hassan ES. Late vs early clamping of the umbilical cord in full-term neonates: systematic review and meta-analysis of controlled trials. JAMA. 2007 Mar 21;297(11):1241-52.
10. Mercer JS. Current best evidence: a review of the literature on umbilical cord clamping. J Midwifery Women's Heal. 2001;46(6):402-14.
11. Mercer JS. Current best evidence: a review of the literature on umbilical cord clamping. In: Wickham S, eds. Midwifery: Best Practice. Edinburgh: Elsevier, 2006; 4: 114-1129.
12. Rheenen P, Brabin BJ. Late umbilical cord clamping as an intervention for reducing iron deficiency in term infants in developing and industrialised countries: a systematic review. Ann of Trop Med. 2004;24(1):3-16.

Cite this article as: Hassan M, Adarsh E, Manjunath S, Shivtej N, Archana DV, Meta V, Spoorthi S. Immediate effects of clamping of the umbilical cord on the newborns. Int J Contemp Pediatr 2019;6:1251-4.