

Factors Influencing Separation of Umbilical Cord at Edagahamus Hospital in Eritrea

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Abstract: Resource limited settings in the world continue to face neonatal complications at birth like umbilical cord infections which poses a greater risk of neonatal morbidity and mortality. The enormous impact is felt in low-income countries, hence, need for further research. At birth, the neonate is vulnerable due to the delicate skin which can be easily damaged by microorganisms. There are various sources of contamination of the umbilicus by microbes especially bacteria from the birth canal and contact with the caregivers. Facility contamination by microbes for instance, Staphylococcal organisms are inevitably the commonest found to be the leading contaminants. The research team compiled a questionnaire that was used with an estimated period between 12 to 15 minutes. Mothers were allowed to ask any doubts from the questions during the time of data collection and were told to dial the team members on the separation day of the cord. Statistically, p-value of (0.05) was considered and taken as a benchmark for the level of significance. Study participants age extended between 18 to 43 years (mean of 28.4±5.04 years). 80.5% of the mothers were housewives and 97.1 of the mothers reside in the city, 94.6% of them claimed that they have taken tetanus vaccination. Caesarean section has been observed to prolong umbilical cord separation among infants compared to those delivered via other modes. This is attributable to less microbes found on the newborns skin especially through cesarean section. In reference to this study findings, the frequency of umbilicus wetness affects the cord separation, for example bathing the neonate or applying a wet towel to wipe the infant's body when compared to other studies whereby it was found out that the drier the umbilical cord the faster it separates. This study has been convicted that elimination of wetness on the neonate's umbilical cord enhances faster detachment as well as control of infections and therefore, recommends the application of the concept dry care as an effective way for cord care.

Keywords: Umbilical Cord Separation Time, Newborn, Neonate, Hygienic Umbilical Cord

1. Introduction

The umbilical cord forms an anatomical link between the mother and the unborn fetus providing the lifeline of supplies between the two which benefits the fetus. At birth, the placenta separates from the uterine cavity but remain attached to the neonate via umbilical cord hence need for clamping and cutting of the cord using sterile equipment.

The newborn vulnerability to infection is because of the immature skin covering that is prone to contamination by bacteria including the normal flora of the skin that occurs later as the neonate develops. Microbes especially bacteria

from the birth canal and contact with the caregivers can affect the umbilical cord of the newborn.

Staphylococcal organisms are inevitably the commonest found to be the leading contaminants in the newborn units of the health facilities. Despite the deficit in knowledge on the real factors that can be attributed to umbilical cord contamination the infected umbilical cord would eventually act as a source of bacterial propagation which often results in the cross contamination within the neonatal wards [1]. Under normal circumstances tissue resolution takes effect and the process results in the healing of the umbilicus once the cord falls off in about 14 days on average [2].

A hygienic environment is critical to the safety of the neonate as well as ensuring that the umbilical cord retains its normal appearance without any signs of inflammation attributable to infections. [3, 4].

Umbilical cord putrification serves as a good agar for microbes' replication leading to complication in tissue resolution by primary intention hence mortality might occur. [5]. Umbilical cord disintegration has different time ranges brought about by the influence of the mode of delivery and the place of delivery as well, including the maternal knowledge and practice of cord care. [6] Health care providers have an obligation to familiarize themselves with the estimated period required for umbilical cord separation to be able to offer useful information to parents or any other care givers of the newborns on the cord care practice. [7]. Umbilical cord infections pose greater risk of neonatal morbidity and mortality. The enormous impact is felt in low-income countries, hence, need for further research. [8]. This study underpins the relevance of information obtained to guide policy on the care that is essential and practical for umbilical cord in the neonatal units which in return reduces the high risks of morbidity and mortality. This study looked at the different factors that will affect maternal, infant regarding the umbilical cord separation.

2. Research Methodology

2.1. Design

A Pragmatic quantitative cross-sectional study.

2.2. Sampling and Setting

The study area was Edagahamus community hospital conducted in the months of October to December 2020.

A representative sample of 314 newborns was included in the study using the agreeable criteria.

2.3. Inclusion Criteria

Mothers 'without any form of mental illness and chronic illness, neonates who are free from birth defects and do not need intensive care, mothers and infants without delivery complications or abnormal deliveries (breech, forceps, vacuum) of which inform consent was obtained as an affirmation.

2.4. Data Collection

After explaining and reassuring the mothers in the wards about the confidentiality and data protection regarding their participation, those mothers who were willing to participate gave both verbal and written consent. A questionnaire was administered by the researchers for each of the participants.

Any doubts were clarified from the mothers during the time of data collection and were given the option of calling via phones later when the cord has detached.

The question about the cord detachment was recorded immediately the information reached the research team. The

mothers who did not call at all on the seventh day from the birthday of the baby were reached by calling them from the hospital. For those neonates with undetached cord after 10 days from birth were contacted on the 15th day by the research team.

2.5. Data Collection Tool

This was a questionnaire-based study with sections consisting of the demographic data of the mother and her infant and the mothers' health related questions were obtained.

The second part of the questionnaire consisted of questions concerning umbilical cord of the neonate, its separation time, mother's awareness for stump care and their washing methods. The third section was about questions of the delivery room as filled by the hospital staff.

2.6. Statistical Analysis

Analysis was obtained by using statistical package for the social sciences (SPSS) version 23 whereby the Mean and Standard Deviation was calculated in summarizing Quantitative variables. Other analysis includes, Univariate descriptive analysis, Frequency, percentages whereas the level of significance was considered at p vale 0.05.

3. Results and Discussions

3.1. Results

Table 1. Demographic characteristics of newborn.

Variable	Mean \pm SD	N (%)
Biological sex		
Male		169 (53.8)
Female		145 (46.2)
Newborn weight		
Less than 2.5kg	1.89 \pm 0.311	35 (11.1)
Greater and equal to 2.5kg		278 (88.5)

53.8% of the newborns included in the study were males with an average month of gestation 8.96 ± 0.25 and over ninety percent born in nine months and 88.5% of the infants with an average weight of the 1.89 ± 0.31 was born greater than 2.5kg. Although it is not included in the table, 87.9% of the newborns begin their first feeding within an hour and above half of the infants were feed 5 hours per day (62%). Almost all infants (98.7%) were breastfeeding and the rest feed with formula. (Table 1).

Maternal age was in the range. 18 to 43 years (mean of 28.4 ± 5.04 years). 80.5% of the mothers were housewives and 97.1 of the mothers reside in the city, 94.6% of them claimed that they have taken tetanus vaccination. 75.5% of the mothers with an average of 2.88 ± 1.68 children were not primiparous. 59.6% Mothers of the study visited hospital for antenatal care with an average of 4.26 ± 1.12 for four and above times of their gestational age. Majority of them (95.2%) delivered through spontaneous vaginal delivery and 81.2% mothers didn't have any pregnancy related events through their whole gestational period.

Table 2. Demographic characteristics of mother.

	Mean \pm SD	N (%)
Age	28.46 \pm 5.014	314
Marital status		
Married		(96.5)
Single		8 (2.5)
Divorced		3 (10)
Educational level		
Illiterate		13 (4.1)
Primary		71 (22.6)
Secondary		159 (50.6)
Higher education		71 (22.6)
Maternal occupation		
Housewife		252 (80.3)
Governmental employee		48 (15.3)
Private employee		14 (4.5)
Place of live		
City		305 (97.1)
Periphery		9 (2.9)
TT Immunization		
Yes		297 (94.6)
No		17 (5.4)
Parity		
Primiparous		77 (24.5)
Not primiparous		237 (75.5)

The mean time of separation of the umbilical cord in babies who were bathed once after birth was 6 ± 1.72 days, 6.5 ± 1.94 days for those bathed twice, 7.9 ± 2.2 days for those bathed four times and 8.9 ± 2.42 and 9.6 ± 3.3 . A statistically significant correlation was observed between the newborns' frequency of bathing and the separation time of the umbilical cord ($F = 21.04$, $p = .000$). It was also found that mothers delivered through spontaneous vaginal delivery had shorter separation time of the umbilical cord, but this correlation was not statistically significant ($T = -1.72$, $p = .11$) (Table 3).

Table 3. Attributable factors to separation of umbilical cord.

Variables	Cord Separation time (DAY)	TEST/P VALUE
Gender		
Male	7.5 ± 2.4	1.15/0.25
Female	7.2 ± 2.4	
Type of birth		
SVD	7.3 ± 2.43	-1.72/0.11
CS	8.7 ± 2.73	
Birth weight		
Less than 2.5kg	7.15 ± 2.3	-0.75/0.45
Equal and Greater than 2.5kg	7.4 ± 2.43	
Antibiotic		
Yes	6.9 ± 1.9	-1.59/0.11
No	7.4 ± 2.5	
How often the baby is washed		
Once	6.0 ± 1.71	21.04/0.000
Two	6.5 ± 1.94	
Three	7.9 ± 2.2	
Four times	8.9 ± 2.42	
Five and above	9.6 ± 3.3	

3.2. Discussions

The failure of the umbilical cord separation at least after 15 days reflects a delay which may be due bacterial

infections and other haematogeneous diseases. [9, 10]. The time of separation of the umbilical cord is significant for the healthcare professionals and other home based care givers. A Turkish study showed that the average number of days was 7.43 ± 2.45 (Min 2 Max 15) days. Similarly a study done in a Spain revealed that $6.61 \text{ days} \pm 2.33$. was the average time. Another study done in a study done in Netherlands revealed $7.4 \text{ days} \pm 3.3$. [11] In this study the findings are incongruent was the mode of delivery and separation time even though, there was no significant study in other studies regarding the separation time for newborns by Caesarean section and of spontaneous vaginal delivery. Neonates delivered by Caesarean section tend to have a longer cord separation time due to less bacterial colonization after birth; fewer leukocytes are attached to the umbilical cord. Further to that, newborns who are delivered by Caesarean section had a longer separation time due to contamination after birth. [12]. This particular finding is supported by a study done by Aniel Shetty and another study in the Netherlands. [13]. This study further revealed that the umbilical cord wetness or dryness determine the separation time. [14]. Other studies confirmed that umbilical cord separation prolongation was only when the umbilical cord got wet two to three times in a day. [15-17], whereas fewer studies have indicated that daily bathing of the newborn brought about the delay in the umbilical separation. [18, 19]. A previous and thoroughly study revealed that as newborns first bath time increases there is a delay in separation time [20]. Similar results showed from different studies indicating a significant effect of birth weight and umbilical cord separation time [21]. In contrast some studies have revealed that increasing birth weight brought about delay in the umbilical cord separation, while other studies indicated that there was a negative correlation between detachment and birth weight. [22] Another study done in neonatal Intensive care unit affirmed that antibiotic therapy and corticosteroid use had no correlation with cord separation time. [23] In contrast, Some studies have put emphasis on Intrapartum antibiotic which continue to exact bactericidal effect on the umbilical cord and peripheral circulation of the newborn as factors contributing to cord separation. [24-25]

4. Conclusions and Recommendation

This study found out that the frequency of washing the baby had significant increase in the number of days before the umbilical cord separation. This finding gives clear idea for the doctors and midwives that mothers should practice dry cord care that wet. Caesarean section has a prolonged separation time as compared to other modes of deliveries as seen in this study. Bacterial colonization of the cord influences the period it takes for the cord to detach. The study further recommends keeping the cord open and dry as an effective way of umbilical cord care.

5. Study Limitation

Our study was conducted in only one hospital Asmara,

which is found in the capital city of Eritrea, It would have a desirable impact if it was been conducted on different hospitals of different zobas around the country in order to gain a fair idea of the factors influencing the umbilical cord separation time. However, our finding has relevance on the study area since no similar studies has been conducted before and also it will be valuable to be used as a baseline for further similar subject of this study.

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Ethical Approval

Ethical approval was obtained from the Health Research Proposal Review and Ethical Committees.

Informed Consent

Informed written consent was obtained from all the participants of the study and confidentiality was ensured.

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