

Umbilical Cord Milking, It Does a Baby Good: Literature Review

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The umbilical cord is a thick jelly-like cord attached to the placenta giving life to the developing fetus during pregnancy. This jelly-like cord consists of two arteries and a vein, which provide oxygen-rich blood, oxygen-poor blood, and nutrients to the baby while also removing waste (Ricci et al., 2021). The umbilical cord is the pathway of blood from the placenta to the liver, heart, and brain; therefore, when the baby is born, and the umbilical cord is cut and clamped, all blood flow stops (Ricci et al., 2021). Healthcare providers can improve the outcome of premature babies by implementing interventions that will supply them with additional blood flow. Umbilical cord milking squeezes the cord to shunt the blood from the placenta to the baby (Thabet Mohamed et al., 2019). This quantitative literature review examines the efficacy of umbilical cord milking in the term and premature population.

Effects of Umbilical Cord Milking on Premature Neonates' and Mothers' Outcomes

According to Thabet Mohamed et al. (2019), umbilical cord milking takes place before clamping the cord, and the placental blood in the cord is manually pushed a few times toward the baby to deliver the additional blood. The authors discovered that umbilical cord milking increases the blood volume from 5-15 ml/kg in the baby immediately after delivery. The additional cord blood provides a better outcome for premature babies by improving hemoglobin and oxygenation, lessening the need for a blood transfusion, reducing the length of stay in the hospital, and decreasing the rate of death. Their study aimed to analyze the impact of umbilical

cord milking on premature babies and their mothers as a safe and effective technique to implement.

Key Points

Thabet Mahomed et al. (2019) aimed to prove that umbilical cord milking is a safe and effective technique for both the mother and premature neonates. The authors accomplished this through their Quasi-experimental design and the Mann-Whitney test to compare the quantitative differences between the two groups involving a total of eighty mothers and their premature babies. The participants were split randomly into two groups of forty, one group was the immediate cord clamping (ICC) control group, and the other was the umbilical cord milking (UMC) study group. A questionnaire collected the mothers' characteristics: age, number of deliveries she has had, supplements or vitamins taken during pregnancy, hemoglobin level, how long her third stage of labor was, and incidence of postpartum hemorrhage. The results from the study group of mothers were: a slightly lower age range (p-value: 0.090), lower number of deliveries (p-value: 0.106), lower number of vitamins/supplements taken (p-value: 0.712), higher hemoglobin level (p-value: 0.34), lower length in the third stage of delivery (p-value: 0.169), lower incidence of postpartum hemorrhage (p-value: 0.675). These findings were insignificant because only one of the p-values was below 0.05. Premature baby characteristics collected included: gender, delivery method, gestational age, weight, vital signs, hemoglobin levels at the sixth hour and thirty-sixth to forty-eighth hour after birth, any interventions used, length of stay, and death. The results from the neonate study group were: females 47.5%, males 52.5%, (p-value: 0.256), vaginal deliver 20%, c-section 80%, (p-value: 0.43), birth weight (p-value 0.798), gestational age (p-value 0.112), oxygen therapy used 55%, not used 45% (p-value: 0.25), blood

transfusion not needed 100% (p-value: 0.25), no intraventricular hemorrhage 95% (p-value: 0.675), mechanical ventilation not used 87.5% (p-value: 0.01), respiratory distress 55%, no respiratory distress 45% (p-value: 0.496), presence of jaundice 30%, no jaundice 70% (p-value: 0.000), no jitteriness 92.5% (p-value: 0.481), no death 92.5% (p-value: 0.01), length of hospital stay p-value: 0.000). The findings were significant in four areas with the p-values being below 0.05. The insignificant findings were oxygen therapy, hemorrhage, respiratory distress, and jitteriness. The authors concluded that the results for the study in the mother group were insignificant overall; however, the neonate study group had many significant values supporting umbilical cord milking as a safe technique for improving the outcome of premature babies. Due to the small size of this study, the authors recommend additional studies with larger sample sizes and the inclusion of additional variables.

Assumptions

Based on the results of their study, Thabet Mahomed et al. (2019) believe that premature infants will benefit from delayed cord clamping with umbilical cord milking. Umbilical cord milking increases hemoglobin levels and decreases the need for blood transfusion, mechanical ventilation, jaundice, length of hospital stay, and death. The authors believe umbilical cord milking will also provide better outcomes for mothers. Finally, the authors suggest that additional research, increased awareness within the healthcare setting, and larger sample sizes will further support the implementation of umbilical cord milking as a safe and effective technique to improve the overall outcome of premature babies.

Deficit/Conclusion

Thabet Mahomed et al. (2019) provided credible assumptions supported by previous research and their data. Therefore, this student accepts the authors' reasoning for using this intervention. This study imparts awareness to healthcare providers regarding the significant benefits of umbilical cord milking and the improved outcomes it provides for premature babies. Labor and delivery nurses and neonatal nurses can use the information from this study to implement protocols and policies for utilizing delayed cord clamping with umbilical cord milking as a safe and effective intervention to support premature babies. Implementing this intervention is recommended as the standard of care (Rabe et al., 2022). It can decrease the demand on healthcare providers and reduce healthcare costs because the number of interventions required will be less, the length of stay will be less, and the incidence of death will be lower (Thabet Mohamed et al., 2019). Failing to accept the findings of this study and implement umbilical cord milking increases the need to utilize more interventions, leads to higher healthcare costs, more extended hospital stays, and puts more strain on the healthcare providers (Rabe et al., 2022).

Safety of Umbilical Cord Milking in Very Preterm Neonates: A Randomized Controlled Study

According to Song et al. (2017), delayed cord clamping or umbilical cord milking provides thirty percent more blood volume and sixty percent more red blood cells to the neonate from the placenta right after birth compared to immediate cord clamping. The authors compared two groups with sixty-six preterm deliveries less than thirty-three weeks of gestation. The randomized groups included thirty-four in the umbilical cord milking group and thirty-two in the

immediate cord clamping group. They aimed to prove the benefits and safety of umbilical cord milking for the mothers and premature babies born before thirty-three weeks of gestation.

Key Points

Song et al. (2017) aimed to prove that umbilical cord milking is safe for very preterm babies and their mothers and provides benefits to both of them. The authors used the Kaplan-Meier analysis for survival comparison, Fisher's exact test, and Relative risk for variables. They received ethical approval from the Institutional Review Board, and women who were going to deliver between twenty-four and thirty-two weeks of gestation were participants. The groups were assigned based on a randomized computer selection, and all women had a dose of betamethasone. The process for the milking group was to put a warm towel around the baby and keep the baby at a level of twenty centimeters below the placenta. At the same time, the doctor milked the umbilical cord four times, with a slight delay in between to allow the cord to refill with blood. Whereas in the other group, the cord was clamped immediately after birth. The results of the mother's characteristics were comparable and did not identify any significant risk or benefit to umbilical cord milking. The significant characteristic in the neonatal group was a decrease in inotropic drug use in the umbilical cord milking group, 29.4% compared to 62.5% (p-value: 0.007). The comparison of hemodynamics and major morbidities had initial hemoglobin (p-value: 0.018), hemoglobin at twenty-four hours (p-value: 0.046), red blood cell transfusion (p-value: 0.049), and deaths (p-value: 0.015). The findings were significant in four areas in the hemodynamic group, with the p-values below 0.05. The authors recommend additional studies of very preterm infants with a larger number of infants for a longer time to determine the long-term outcomes.

Assumptions

Based on the result of the study, Song et al. (2017) believe that umbilical cord milking is safe and beneficial for preterm babies born at less than thirty-three weeks of gestation. They presume that the baby's body temperature stabilization was from receiving the additional placenta blood and covering the baby in a warm towel. The authors conclude that delayed cord clamping with umbilical cord milking is safe and effective for very preterm babies and could also improve survival due to the decrease in intraventricular hemorrhage.

Deficit/Conclusion

Song et al. (2017) 's assumptions are plausible based on their study results. Therefore, this student accepts the authors' reasoning for using this intervention. This study brings awareness of safe and effective ways to increase hemoglobin levels, reduce blood transfusions, reduce inotropic drug use, and have a remarkably lower mortality rate. Nurses can use these findings to develop tools, policies, and protocols to implement umbilical cord milking in very premature infants. Failing to utilize the results of this study will not be in the best interest of patient safety and well-being. Moreover, it will unnecessarily increase the need for interventions, extended hospital stays, and mortality risk for these babies.

Assessment of Umbilical Cord Milking on the Outcome of Term and Preterm Infants, Controlled Clinical Trial

According to Taha (2020), immediate cord clamping prevents the neonate from receiving anywhere from 60-100 ml of blood and 30-50 mg/kg of iron. In contrast, umbilical cord milking is a safe and effective way to provide the neonate with additional blood and iron from the

placenta immediately after birth. Umbilical cord milking is cost-effective, providing blood directly from the placenta through the cord, improving iron stores, and reducing anemia in the neonate. In this randomized, controlled study, the author compares two hundred neonates in the umbilical cord milking group and two hundred neonates in the immediate cord clamping without milking group. The author of this study incorporates the inclusion of the neonates' results at six weeks of age which helps solidify that umbilical cord milking improves iron stores and hemoglobin.

Key Points

Taha (2020) aimed to prove that when the umbilical cord is cut at twenty-five centimeters right after birth and milked, it provides a safe way to deliver additional placental blood to the neonate. Umbilical cord milking improves total blood volume, hemoglobin, hematocrit, and iron stores, reducing the need for transfusion and minimizing the risk for anemia. The author performed a randomized, controlled clinical study using the Mann-Whitney test to compare quantitative differences between the groups involving four hundred neonates. In the study group, the umbilical cord was cut immediately after birth and clamped at twenty-five centimeters; with the neonate under a warmer, the cord was milked three times and then clamped up to three centimeters from the umbilicus. In the control group, the cord clamping was done at the umbilicus immediately, with no cord milking. The author collected all mothers' characteristics and found no significant differences. The following comparison was obstetric history. The results of the study group were: mothers with one pregnancy 21%, more than one pregnancy 79% (p-value: 0.001), vaginal delivery 19%, and cesarean section 81% (p-value: <0.001), the findings of this study were significant with the p-values below 0.05. The results of the neonatal characteristics only found one significant category with a p-value less than 0.05; gestational age

(p-value: 0.027). Comparing outcomes between the neonatal groups did not yield any significant results. However, there were many significant findings when comparing hemodynamics. The results of the study group were: heart rate at thirty min (p-value: <0.001), heart rate at twelve hours (p-value: <0.001), respiratory rate at thirty minutes (p-value: <0.001), blood pressure at thirty minutes (p-value: <0.05), blood pressure at twelve hours (p-value: <0.05), blood pressure at forty-eight hours (p-value: <0.05). Comparing cyanosis, jaundice, and pallor also yielded significant findings. The results were: cyanosis at thirty minutes (p-value: 0.018) and pallor at thirty minutes (p-value: 0.028). The final neonate comparison was hematological, and the results were: hemoglobin at twelve hours (p-value: <0.001), hemoglobin at forty-eight hours (p-value: <0.001), hemoglobin at six weeks (p-value: 0.002), packed red blood cell volume at twelve hours (p-value: 0.016), blood cell volume at forty-eight hours (p-value: 0.016), bilirubin at forty-eight hours (p-value: <0.001), iron at six weeks (p-value: <0.001). The results of the hematological comparison were significant since all categories yielded a p-value below 0.05. The authors' findings aligned with their belief that umbilical cord milking was safe and effective and improved the hematological status of term and preterm neonates.

Assumptions

Taha (2020) believes that cutting and clamping the umbilical cord immediately after birth leads to anemia and deprivation of a good amount of placental blood that would otherwise benefit the neonate. The author presumes that cutting the umbilical cord immediately after birth, twenty-five centimeters from the umbilicus, and milking the blood from the cord to the term or preterm neonate will improve hemoglobin, hematocrit, and iron stores in addition to improving vital signs, cyanosis, pallor, and jaundice. Lastly, the author believes that umbilical cord milking

is a quick, safe and effective way to improve the hematological status, prevent iron deficiency anemia, and reduce infant mortality.

Deficit/Conclusion

Taha (2020) provides credible assumptions supported by previous research and the data from this study; therefore, this student accepts the author's reasoning for using this intervention. This study included comparisons of the delivery method, term, and preterm neonates, and follow-up results of the neonates at six weeks old. The information provided in this study would benefit labor and delivery and neonatal providers in implementing updated policies and protocols for utilizing umbilical cord milking as a quick, safe, and effective intervention to improve the neonates' vitals and hematologic status and prevent iron deficiency anemia. Implementing this intervention is the standard of care (Rabe et al., 2022). Suppose the healthcare providers elect not to utilize the findings of this study. In that case, they will put the neonate at increased risk for interventions such as blood transfusions, iron supplementation, and an increased hospital stay. The additional interventions and lengthier hospital stay are not in the best interest of the patient or the healthcare providers.

Conclusion

The umbilical cord is the pathway of blood from the placenta to the liver, heart, and brain; therefore, when the baby is born, and the umbilical cord is cut and clamped, all blood flow stops (Ricci et al., 2021). Each of the three studies provided credible evidence to support their assumptions. Thabet Mohamed et al. (2019) used a Quasi-experimental design to compare eighty mothers and their preterm neonates. The authors provided evidence that delayed cord clamping with umbilical cord milking was a safe and effective intervention to increase hemoglobin levels

and decrease the need for blood transfusions or mechanical ventilation in preterm neonates. Song et al. (2017) wanted to prove umbilical cord milking to be safe and effective for the most vulnerable population; therefore, their study was the very preterm neonates, all of whom would be born between twenty-four and thirty-two weeks of gestation. The authors used the Kaplan-Meier analysis for survival comparison, Fisher's exact test, and Relative risk for variables to compare sixty-six neonates. The authors provided credible evidence that delayed cord clamping with umbilical cord milking is safe and effective for preterm babies and could improve survival due to the decrease in intraventricular hemorrhage. Taha (2020) took a different approach and wanted to prove that immediate cord cutting about twenty-five centimeters from the umbilicus with cord milking was a quick, safe and effective way to provide additional placental blood to preterm and term neonates. The author also included follow-up results of the neonates at six weeks old. This randomized controlled study of four hundred neonates provided credible evidence to support the findings. The study concluded that umbilical cord milking is a safe and effective way to supply the neonate with additional placental blood, reduce the risk of iron deficiency anemia, increase the hemoglobin level, and lower the neonates' mortality rates.

The results of these quantitative studies impart awareness to healthcare providers regarding the significant benefits of umbilical cord milking and the improved outcomes it provides for the ultra-preterm neonate to the term neonate. Nurses can use a questionnaire, as indicated in Thabet Mahomed et al. (2019) 's study, to obtain vital characteristics of the mother and baby as a screening tool for risk assessment. They can use either Song et al. (2017) 's or Taha (2020) 's findings to reduce the risk of hypothermia by keeping the neonates warm during cord milking with a warm towel or by putting the baby in a warmer. Neonatal and labor and delivery nurses

can take this knowledge to recognize the need to implement umbilical cord milking and create quality improvement strategies to change policies, procedures, and protocols to improve patient care and safety and nursing safety satisfaction (QSEN Institute, 2020). These quality improvement strategies will increase nurse and patient satisfaction by minimizing complications, reducing the length of stay, and decreasing the mortality rate of the most fragile population. Therefore, nurses can utilize evidence-based practice to reduce the risk of iron deficiency anemia and provide a better outcome for neonates. The healthcare system would benefit by utilizing the umbilical cord milking intervention because it is a quick, safe and effective way to provide placental blood to the neonate. Umbilical cord milking improves hemoglobin and hematocrit levels, decreases the need for blood transfusions, decreases the length of hospital stay, and reduces the neonate mortality rate. Moreover, it alleviates strain on healthcare providers and reduces costs for the healthcare system.

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