

Title: Umbilical Cord Milking Improves Systemic Blood Flow in Premature Infants: A Randomized Controlled Trial

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Background: Low systemic blood flow is frequently a precursor to significant intraventricular hemorrhage in extremely preterm infants. Umbilical cord milking (UCM), in which the unclamped umbilical cord is milked before it is clamped, may have an effect on systemic blood flow immediately after birth. Compared to delayed cord clamping, UCM results in rapid blood transfer from the placenta to the newborn, allowing other interventions such as resuscitation to proceed.

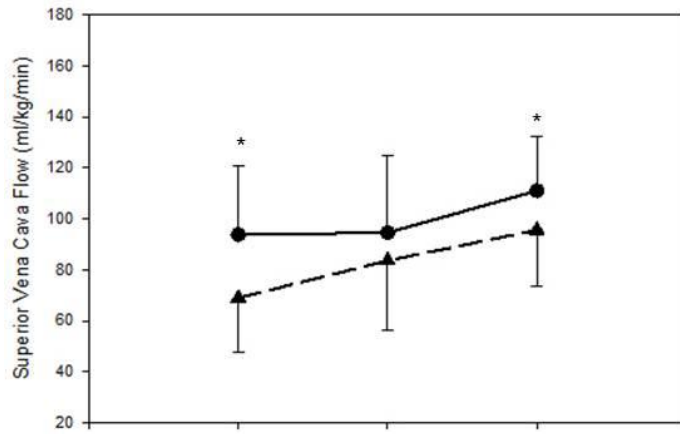
Objective: To determine whether umbilical cord milking improves systemic blood flow in premature infants.

Design/Methods: Sixty inborn infants <32 weeks gestation were enrolled. Upon delivery, subjects were randomized to UCM or immediate cord clamping (ICC). Blinded serial echocardiographic examinations were performed for all infants at 3 time points: in the first 6 hours of life, at 18 and at 30 hours of life. Relevant prenatal and neonatal data were obtained from the medical record.

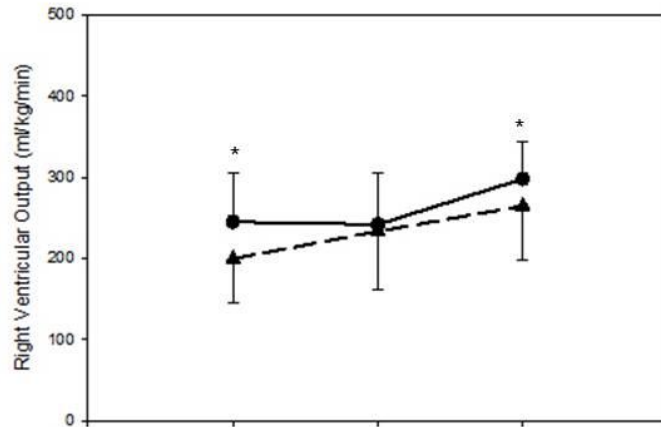
Results: We enrolled 60 infants <32 weeks. There were no differences in the majority of maternal and neonatal data including gestational age, birth weight, admission temperature, or peak bilirubin between groups. Infants who received umbilical cord milking had higher measures of systemic blood flow (figure 1). Infants who received UCM had less exposure to blood transfusions, (37 percent vs 63 percent, $p=0.039$), had higher Hct at 12 hours of life (47 ± 9 vs 42 ± 7 , $p=0.019$) and received fewer days of oxygen (30 ± 41 vs 10 ± 19 , $p<0.027$).

Conclusions: This is the first randomized controlled trial demonstrating improved systemic blood flow with UCM in premature infants. UCM at birth decreases the need for additional interventions such as blood transfusions and reduces the number of days of oxygen. Future large prospective trials are needed to determine whether umbilical cord milking improves long term neurodevelopmental outcomes.

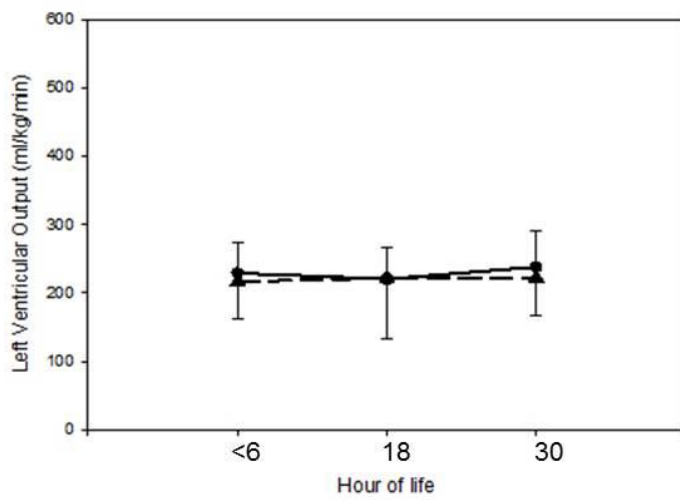
Changes in Superior Vena Cava flow over time



Changes in Right Ventricular Output over time



Changes in Left Ventricular Output over time



* p<0.05 vs immediate clamping

