Device-assisted feeding and poor growth in newborns with CHD may lead to poor neurodevelopment

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Newborns with a congenital heart defect (CHD) often need advanced medical care to survive, leaving them vulnerable to cognitive delays. Various factors, like prematurity, length of hospital stay, cardiac arrest, amongst others, contribute to these delays. But what role does proper growth and feeding mode at the beginning of life play? A research team - led by the University of Pennsylvania School of Nursing - investigated and found that newborns (up to three months) with poor growth and CHD, who required device-assisted feeding, were at an increased risk for neurodevelopmental delays at six and twelve months. The team's findings are set for publication in an upcoming issue of *The Journal of Pediatrics*.

The prospective, observational, cohort study investigated the growth and development in the first year of life in infants who had undergone neonatal cardiac surgery during the first month of life. A total of 72 infants with CHD at six and twelve months were assessed. Research procedures included anthropometric (measurement and study of the human body) evaluations at three, six, nine, and twelve months. Feeding mode (bottle or breast only, bottle or breast combined with tube assisted feeding, or tube assisted feeling only) was recorded at discharge and at three months.

Of the 72 newborns with complex CHD, 38 (53 percent) were exclusively orally fed at hospital discharge; whereas the other 34 (47

percent) required device-assisted feeding, combined with oral feeding. The study determined that there was an association between growth parameters and early feeding mode with neurodevelopmental outcomes in the first year of life. Growth measurements at three months of age proved to be significantly associated with both cognitive and motor outcomes at both six and twelve months of age. Also unique to this study was the association between feeding mode and the increased risk of neurodevelopmental delays. Newborns who required device-assisted feeding at hospital discharge and at three months of age were at the greatest risk of altered cognitive development.

"Newborns with complex CHD face many challenges in their early life. Infants requiring device-assisted feeding are unable to ingest the optimal calories needed for proper growth and development," said the study's principal investigator, Barbara Medoff-Cooper, PhD, RN, FAAN, the Ruth M. Colket Professor in Pediatric Nursing. "The need for device-assisted supplemental feeding may serve as a predictor for the infant's overall health status."

The inability to feed may be an indicator of immature feeding skills, which may suggest the need for early device-assisted feeding could be indicative of abnormal brain development. Infants with complex CHD with poor growth and those who require device-assisted feeding early in life are at increased risk for neurodevelopmental disability. There are significant associations between the need for device-assisted feeding and lower weight, length, and head circumference at three months with neurodevelopmental outcome at both six and twelve months. Close monitoring of feeding skills and growth trajectories are necessary to identify those infants at increased risk for developmental delays.

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