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Dextrose gel use in treatment of critical hypoglycemia in neonates

Introduction: Transient neonatal hypoglycemia is a common problem affecting many newborns. Up to 15% of healthy newborns and up to 50% of babies in at risk groups are affected. Independent risk factors for hypoglycemia include prematurity, high or low for gestational age birth weight as well as infants born to mothers with diabetes. Correcting critically low blood glucose concentration is important to avoid more serious complications and adverse outcomes. Critical hypoglycemia can put newborns at risk for potentially life threatening consequences including seizures, brain damage, coma and death. Traditional approach in management of neonatal hypoglycemia included intense feeding interventions as well as close blood glucose monitoring. Intravenous dextrose was reserved to babies in whom the initial conservative approach failed. Despite varying protocols, many babies still struggle with low blood glucose and require more frequent monitoring which causes more lab draws, disruption of bonding between a mother and a baby, interruption of breastfeeding, and may need to transfer to a neonatal intensive care unit (NICU). More recently, oral dextrose gel use has been shown to be beneficial as an adjunct therapy in management of neonatal hypoglycemia. This study explores the effect of oral dextrose gel on correcting critically low blood glucose levels in neonates.

Methods: Dextrose gel has been incorporated into a well-established hypoglycemia protocol which was based on the American Academy of Pediatrics guidelines. 40% dextrose gel was administered in addition to standard interventions with intense feeding when indicated. The trial has been initiated in March of 2016. Subjects included were all newborns that met criteria of small for gestational age (SGA), large for gestational age (LGA), infants of diabetic mothers (IDM), and preterm (<37 weeks) who are born within that time frame. Patients were divided into two groups based upon their admission date. Those admitted prior to oral dextrose gel trial and those admitted up to six months following oral dextrose trial. Data was collected from a retrospective chart review include blood glucose concentration, comorbid conditions, number of oral dextrose gel doses administered, need for transfer to NICU for

treatment with an intravenous glucose and length of stay in NICU.

Results: Primary outcome variables for this study are the need to transfer to NICU due to critical hypoglycemia and a length of stay in NICU. Critically low blood glucose concentration in the first 4 hours of age is defined as less than 25 mg/dl. There was a 12% reduction in need for NICU transfers for intravenous glucose treatment due to critical hypoglycemia in infants treated with oral dextrose gel vs. infants who received intense feeding intervention only (38% vs 50%). Moreover, there was a 27% reduction in length of hospital stay in infants who was transferred to NICU due to hypoglycemia after an initial trial of dextrose gel. The beneficial effect of oral dextrose gel in correcting critical hypoglycemia was observed across all four risk factors for hypoglycemia.

Conclusion: 40% oral dextrose gel is an effective treatment in correcting critically low blood glucose concentration in newborn babies with risk factors. It is simple, inexpensive and safe intervention. It has been shown to be superior to intense feeding intervention alone in treating critical hypoglycemia, and an effective tool in decreasing the need for treatment with an intravenous glucose. Oral dextrose use shortens duration of hospital stay due to hypoglycemia.

Speaker Biography

Lana Gagrin attended Bashkirian State University Medical School. She completed her Pediatric Residency at the Michigan State University's College of Human Medicine GRMEP in 2007. She earned her Master's degree in Public Health at the University of Michigan in 2010 while also working as a pediatrician in the Outpatient General Pediatric Clinic. She joined the staff of the Helen DeVos Children's Hospital's Academic General Pediatrics in 2010. In 2011, she joined the staff of Spectrum Health Medical Group and became a Medical Director of Newborn Services in Grand Rapids Campus. As a Medical Director she led the team of physicians in establishing new practices for breastfeeding support which resulted in a successful Baby-Friendly Hospital designation in 2014. She serves as a core faculty at the Pediatric Residency Program at Spectrum Health. She is a co-founder and a Director of Quality Improvement and Patient Safety Rotation, and has been leading multiple quality improvement initiatives. She completed her Lean Healthcare Certification at the University of Michigan in 2014. In 2015, she became an International Board Certified Lactation Consultant.

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