The effect of Dextrose gel in treatment of low blood glucose concentration in newborn babies with specific risk factors

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Abstract:

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. 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 at times need for transfer to the 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 low blood glucose levels in neonates based on specific risk factors.

Methods: 40% dextrose gel has been incorporated into a well-established hypoglycemia protocol which was based on the American Academy of Pediatrics guidelines. Dextrose gel was administered in addition to standard interventions with intense feeding when indicated. The trial has been initiated in March 2016. Subjects included were all newborns that met criteria of small for gestational age, large for gestational age, infants of diabetic mothers , and preterm (<37 weeks) who were 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 four months following oral dextrose trial. Data was collected from a retrospective chart review include blood glucose concentration, comorbid conditions, feeding choice, number of oral dextrose gel doses administered, need for transfer to NICU for treatment with an intravenous glucose.

Results: The primary outcome variable for this study is the blood glucose concentration following oral dextrose gel administration and the length of treatment to achieve euglycemic state defined as blood glucose concentration of 45 mg/dl. Oral dextrose gel was more effective in correcting hypoglycemia in large for gestational age infants and infant of diabetic mothers (70% and 62% treated successfully) compare to small for gestational age infants and premature infants (37% and 49% respectively). Addition of oral dextrose gel in management of hypoglycemia was superior to refeeding alone in all babies with risk factors. Overall, there was a significant reduction in the need for NICU transfers for intravenous glucose treatment due to persistent hypoglycemia.

Conclusion: 40% oral dextrose gel is a safe and effective treatment in correcting low blood glucose concentration in newborn babies with risk factors. It is simple, inexpensive and low risk intervention. It has been shown to be superior to refeeding alone in treating hypoglycemia, and an effective tool in decreasing the need for treatment with intravenous glucose.