

Neonatal Transport

*The Newsletter of the Maryland Regional Neonatal Transport Program
December 2008*

Infants of Diabetic Mothers

Diabetes is a condition in which the body does not make enough of or does not normally use the hormone insulin. Insulin is a growth hormone, which is necessary to maintain healthy blood sugar levels. Increased metabolic rate and other changes in pregnancy impacts the way a woman's body utilizes glucose. Some women already have diabetes when they become pregnant. Others are unable to produce enough insulin during pregnancy, a condition called gestational diabetes. Whether the condition exists before pregnancy or develops during it, the increased glucose available to the fetus from the mother's blood alters the environment for fetal development.

Infants of diabetic mothers (IDM) may have a variety of complications. The frequency and severity of the complications are often related to the severity of the maternal diabetes.

Hypoglycemia is related to the sudden removal of the glucose supply and production of insulin by the infant. Hypocalcemia and hypomagnesemia, is often related to maternal hypoparathyroidism and maternal diabetes is believed to suppress neonatal parathyroid function. Serum calcium is elevated after an increase in parathyroid hormone (PTH) concentration. The PTH response in the normal neonate that may occur on the second or third day after birth does not occur in the IDM until 48 hours or later. Macrosomia may result in dystocia. Large for gestational age (LGA) is a direct result of the overproduction of insulin by the infant. Polythemia may add to interruption in glucose homeostasis and contribute to the increased incidence of hyperbilirubinemia.

Maternal diabetes may alter (inhibit/delay/accelerate) surfactant production.

Mothers with chronic diabetes and advanced vascular involvement often have infants who are small for gestational age (SGA). This may be related

to decreased placental blood flow and then hypoglycemia related to the lack of glycogen stores. Cardiomyopathy in the IDM can be congestive or hypertrophic. Hypertrophic cardiomyopathy in the neonate has been associated with poorly controlled diabetes in the mother and neonatal hypoglycemia. The critical period for cardiac development is before 10 weeks gestation. subaortic stenosis might be associated with symptomatic congestive heart failure. Prematurity, respiratory distress syndrome, and increased incidence of birth defects (affecting heart, kidneys, stomach and intestines, brain and spinal cord and or bones) have also been reported.

The glucose level in the fetus is approximately 70 to 80% of the maternal glucose level. Since insulin does not cross the placenta the infant of a diabetic mother must increase insulin production in response to elevated maternal glucose levels. When the umbilical cord is cut glucose supply is abruptly stopped, yet the infant's insulin levels remains elevated. This may cause the blood glucose to fall rapidly. Insulin levels can remain elevated for a period of days, during which time IV glucose may be required.

Early evaluation of hypoglycemia is recommended as follows. The incidence of hypoglycemia in the infant of a diabetic mother is 15-75%. Evaluate blood glucose within 30 to 60 minutes after birth and then every 15-30 minutes based on glucose values and health status of infant. When blood glucose has a pattern of stability and remains consistently in the normal range of 50 - 110 mg/dl the frequency of glucose monitoring can be decreased and eventually stopped. It is not uncommon for the infant of a diabetic

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mother to require frequent glucose screening for as long as 24 to 72 hours after birth. Blood glucose levels less than 50mg/dl and the inability to tolerate oral feeds should be treated with intravenous infusion of D10W at 80mg/kg/day and bolus given of 2ml/kg of D10W at a rate of 1ml per minute. Recheck blood glucose screen within 15 to 30 min after bolus. Blood glucose levels less than or equal to 50mg/dl can be repeated for a total of three boluses before increasing IV fluids to 100 or 120 mls per kg per day. Glucose supplementation via intravenous fluids may be required for several days. The addition of electrolytes and minerals in the intravenous fluids may be indicated by laboratory analysis.

References

Zaichkin, J. (2002) Newborn Intensive Care What Every Parent Needs to Know 2nd Edition NICU, Inc: CA
Karlsen, KA. (2006) The S.T.A.B.L.E. Program: Post-resuscitation/pre-transport stabilization care of sick infants, Guidelines for neonatal healthcare providers (5th ed.). The S.T.A.B.L.E. Program : UT
Karlsen, KA. (2006) Cardiac S.T.A.B.L.E. The S.T.A.B.L.E. Program : UT
Cowett, R. M. (2002). Neonatal Care of the Infant of the Diabetic Mother, Neo Reviews
American Academy of Pediatrics: IL

Transport statistics

The first of 2008 was busy for the MRNTP. On an annual basis, the program completes 700-800 transports per year. The first three quarters of 2008 proved the team is well on the way to meet or exceed that number for 2008. Below is the breakdown by quarter of number of transports the team has performed thus far. These numbers include primary emergent transports, elective primary, back/return transports and step-down/convalescent.

January-March-191

April- June- 183

July- September-193

MRNTP Community Initiatives

Once again, members of the MRNTP are participating in the Maryland Special Olympics Polar bear Bear Plunge. The event will be held on Saturday, January 24, 2009 at Sandy Point State park. The MRNTP team partners with the Maryland State Police to brave the chilly waters of the Chesapeake Bay. Bill Tippet, Kathy Mallamo, Colby Millen, Brian Picarello, Bronwyn Willett, Mike Mannozi, Teddy Baldwin and Shawn Loomis are serving as our frigid ambassadors!! Please visit www.plungemd.com and sponsor the MRNTP Polar Bears!

Season's Greetings

As 2008 comes to a close, the staff of the MRNTP would like to take this opportunity to thank all of the referring hospital's medical staff for their continued efforts to optimize neonatal care within the State of Maryland. We wish all of you and your families a very safe, prosperous and Happy New Year. To help celebrate the season, the JHH nurses of the MRNTP team have "adopted a family" that was identified by the social work department that is in need of some assistance. We will be donating clothing and gifts to a couple and their six children, ages 2 months to 13 years that are seen in the Harriet Lane Clinic at Johns Hopkins Hospital and will be providing the family with a holiday dinner.



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Neonatal Resources on the World Wide Web

If you need to reference a specific disease state, medication, treatment protocol or research study; the following resources may be of interest to you. So, please take time to peruse these links and broaden your neonatal knowledge base!

<http://www.hopkinscme.net/ofp/eneonatalreview/index.html>

<http://peds.wustl.edu/gi/neonatal/>

<http://johnsarm.net/neonatology.htm>

<http://www.adhb.govt.nz/newborn/TeachingResources/Ventilation/Ventilation.htm>

<http://www.adhb.govt.nz/newborn/Guidelines.htm>

http://www.mrw.interscience.wiley.com/cochrane/cochrane_clsystrev_crglist_fs.html (In this link, scroll down to the Cochrane neonatal group, click that link and it takes you to all the different reviews. It reviews all the current research and rates the studies and the conclusion of the studies.

<http://www.uihealthcare.com/depts/med/pediatrics/iowaneonatologyhandbook/index.html>

<http://www.nicuniversity.org/newsviews.asp>

WMANN

Friday, May 15, 2009 WMANN CONFERENCE!

<http://wmann.homestead.com>

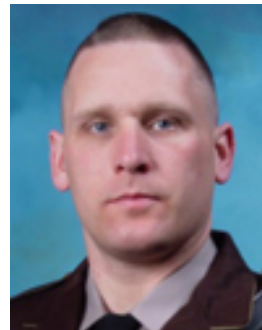
Memorials

2008 proved to be a tragic one for our colleagues at Maryland State Police Aviation Division



September

Trooper Mickey Lippy & Pilot Stephen Bunker were killed in a helicopter crash while performing a medical evacuation of two critically injured teenagers from Charles County.



November

Tobin Tribel died from injuries sustained after being struck by a motor vehicle while jogging while vacationing in NC.

