†1726 SYMPATHETIC NERVE STIMULATION ATTENUATES CEREBRAL BLOOD FLOW (CBF) IN HYPERCAPNIC NEWBORN PIGLETS. L. Craig Wagerle,* Savitri P. Kumar,* and Maria Delivoria-Papadopoulos. University of Pennsylvania, Departments of Physiology and Pediatrics, Philadelphia, PA. 19104

Previous work suggests that sympathetic nerve activation may influence CBF in hypoxic or asphyxiated newborn animals. The present experiments investigate the effect of respiratory acidosis on the efficacy of sympathetic nerves on CBF in 5 anesthetized (30% N_2O) newborn piglets. The right sympathetic trunk was electrically stimulated for 60s (16 Hz, 15v, 3 msec) while the left side served as control and blood flow to each hemibrain was measured (microspheres) during (1) baseline (no stimulation), (2) stimulation during normocapnia (PCO_2=38±2 torr), and (3) stimulation during hypercapnia (PCO_2=62±4 torr). During baseline, CBF was 88±6 and 87±7 ml/min/100g in the left and right hemibrain respectively. Sympathetic nerve stimulation decreased flow to the right hemibrain by 6±1% during normocapnia. Most significant vasoconstriction was noted in the cerebrum (CBM) and choroid plexus (CP) where stimulation reduced flow by 8±2 and 60±10% respectively. During hypercapnia where CBF was increased to 294±58 ml/min/100g, sympathetic nerve stimulation decreased flow to the right hemibrain, CBM, and CP by 25±4, 34±4, and 71±8%, respectively. Blood pressure and blood gases were not affected by sympathetic stimulation. These data suggest that activation of sympathetic nerves during normocarbia has minimal effects on CBF in the newborn piglet but profoundly decreases choroid plexus flow. During hypercapnia, however, activation of sympathetic nerves may severely attenuate the vasodilatory capacity of the cerebrovasculature and thus compromise the vascular response of the newborn brain. (NIH T35-HD-07217-10A1)

1729 BRAIN SPECIFIC CREATINE KINASE IS NOT ASSOCIATED WITH SHORT-TERM NEUROLOGICAL OUTCOME IN VLBW INFANTS. John Wimmer, Rita Saldanha, Steve Engelke, Grant Somes, Arthur Kopelman (Spon. by W. Laupus). East Carolina Univ Med Sch, Pitt Cnty Meml Hosp, Dept of Peds, Greenville NC

Perinatal asphyxia and intracranial hemorrhage are known to be major determinants of neurodevelopmental outcome in VLBW neonates, but specific and accurate predictors are not well established. Recent investigations have indicated that serum creatine kinase isoenzyme BB (CK-BB) levels are associated with outcome.

In this prospective study serum samples were obtained at 24 ± 4 hours in 83 preterm infants < 32 weeks gestation. Cord blood was also available for analysis in 38 of them. Total CK and CK-BB by electrophoresis were determined on each of the samples. Mortality, cranial ultrasound scores on days 1 and 3, the presence of seizures within the first 2 weeks, abnormal neurological status (Sarnat Score) during the first 2 weeks, Parmalee neurological exam score at the time of discharge, and the presence of hydrocephalus were measured as short-term outcomes.

Using a non-parametric test for association (Kendall's tau), no associations were found between CK-BB values in either cord blood or 24 hour samples and any of the above parameters. Thus, CK-BB is not associated with short-term neurological status. Follow-up is underway to evaluate whether CK-BB may predict long-term neurodevelopmental outcome.

●1727 ASYMPTOMATIC CONGENITAL CMV: CT AND ABR ABNORMALITIES. W. Daniel Williamson, Alan K. Percy, Martha D. Yow, L. Paul Gerson, Mark L. Koppelman, Francis I.Catlin, Murdina M. Desmond. Baylor College of Medicine, Texas Children's Hospital, Department of Pediatrics, Houston.

Five infants with asymptomatic congenital CMV documented by urine culture in the first week of life were evaluated in a prospective study of the relationship between maternal CMV serology during pregnancy and neurodevelopmental outcome of the infant. Initial assessment at 1 week to 3 months of age consisted of unenhanced cranial CT scan, ABR, and neurologic exam, with reassessment at 6-9 months of age. Three of the 5 infants had abnormalities on one or more of these exams. Two infants had abnormal lucency of the cerebral white matter on CT scan; on subsequent scans, one had mildly dilated lateral ventricles and one had no abnormalities. Both infants were mildly hypotonic and had abnormal ABR's characterized by prolonged Wave V latencies and Wave I-V intervals (≥2 S.D. above mean for age, Salamy and McKean, Electro Clin Neuro, 1976), with normal Wave I latency. Serial ABR's revealed gradual decrease in latency times to normal limits by 6-9 months of age. A third infant had both an abnormal CT scan (abnormally prominent interhemispheric fissure and cisternal spaces), but normal ABR. In the absence of other perinatal risk factors, three "normal" infants had CT, ABR and/or neurologic abnormalities which may be related to the in utero CMV infection. However, the pathophysiology and long term significance of these findings are not clear. Longitudinal assessment will be essential to define the full impact of in utero exposure to CMV.

●1730 BIOTINIDASE ACTIVITY IN BRAIN AND ITS IMPLICATION IN BIOTINIDASE DEFICIENCY. Sharon F. Suchy and Barry Wolf. Departments of Human Genetics and Pediatrics, Medical College of Virginia, Richmond, VA 23298.

The neurologic features of biotinidase deficiency include myoclonic seizures, ataxia and hearing loss which may occur without overt organic aciduria. Previous studies by Pispa (Ann Med Exp Biol Fenn 43, suppl. 5:1-39, 1965) indicated that there was no biotinidase activity in normal mammalian brains. However, using a sensitive radioassay we have determined that the mean activity in perfused rat brains (n=4) is 9.9 pmol/min/mg protein (range= 6.4-12.0) in the brain stem, 3.5 (2.9-4.3) in the cerebellum and 1.7 (1.0-2.2) in the cerebrum. The mean enzyme activity in human cerebrum is 32 pmol/min/mg (7.2-91; n=6). The mean biotinidase activity in human CSF is 30 pmol/ min/ml (range=0-100; n=44). These results indicate that the brain is capable of recycling biotin. Therefore, in biotinidase deficient individuals the brain's only access to biotin is via transport across the blood-brain barrier. Since the requirement for biotin in the brain appears to be high and studies by Baker et al. (Nutr. Rep. Intl. 27:661-670, 1983) indicate that the concentration of biotin in the CSF is only 1/5 that of the serum, then a severe systemic depletion of biotin would result in concomitant decrease of biotin in the brain. Even if carboxylase turnover is slower in the brain than in other tissues, biotin deficiency may occur sooner in the brain and preferentially affect biotinylation of the carboxylases, primarily pyruvate carboxylase, resulting in a localized accumulation of lactate and/or organic acids which may not be detectable in the urine.

†1728 CEREBELLAR HEMORRHAGE: DEVELOPMENTAL & NEUROLOGIC OUTCOME. W. Daniel Williamson, Alan K. Percy, Marvin A. Fishman, William R. Cheek, Susan D. Thurber, Murdina M. Desmond. Baylor College of Medicine, Texas Children's Hospital, Department of Pediatrics, Houston.

In an effort to elucidate the long-term effects of neonatal cerebellar hemorrhage, 6 children with this lesion documented on CT scan were assessed neurodevelopmentally. All were managed conservatively without surgical evacuation of the hematoma. Perinatal data and developmental performance (on the Gesell, Bayley or McCarthy) are shown below:

Age Evaluated (Months)	Birth Weight	Gest. Age (Weeks)	Shunt	Apgar 1'	Apgar 5'	Method of Delivery	D.Q.
7	3960	40	+	9	9	C/S-Abruptio Pla.	54
15	2977	39	+	9	9	Vaginal, Forceps	60
21	3174	37	-	8	10	Footling Breech	53
32	3300	40	-	9	10	Vaginal, Forceps	75
44	2070	37	-	6	8	Frank Breech	84
48	2807	39	-	5	7	Frank Breech	52

Neurologic findings included mild to moderate hypotonia (5), ataxia (4), titubation (2), dysmetria and/or tremor (4). Of the 5 children above 1 year of age, only 1 ambulated without aids. In general, motor skills were more severely impaired than cognitive functioning. These data suggest that children surviving cerebellar hemorrhage not only have neurologic deficits related to the site of hemorrhage, but cognitive deficits, related to a more generalized cerebral insult. Follow-up is indicated to clarify ultimate intellectual and neurologic functioning.

●1731 INFANTILE BERIBERI PRESENTING AS LEIGH'S SYNDROME. David T. Wyatt, Michael J. Noetzel, Richard E. Hillman, Washington University School of Medicine, St. Louis Children's Hospital

A six month old male infant presented with a left 6th nerve palsy and increasing frequency of emesis. For 3-1/2 months his intake had consisted solely of a skim milk product containing <10 μ g/L of thiamine. Initial electrolytes, blood gas, LP, and CT scan were normal. He showed poor swallowing, intermittent staring and jerking, hypothermia and a progressive hyponatremia culminating in a seizure and respiratory arrest. Despite intubation, electrolyte correction, antibiotics and steroids, he developed total opthalmoplegia, hypotonia, mouthing movements, lethargy, apnea and bradycardia. A CT scan showed bilateral putaminal luscencies but no brainstem abnormalities. Serum glutamic acid, glutamine, alanine, and leucine were mildly elevated (4 days IV glucose only). Normal lab: cortisol, 17-OH progesterone, DHEA, uric acid, bicarb, liver functions, NH_4, T_4, Ca, P, Mg, Cr, urine porphyria studies. Thiamine supplementation resulted in rapid clinical improvement. CT scan three months later revealed almost complete resolution of the putaminal luscencies. One year later, mild gross motor delays remain; growth is normal; no seizures have occured.

	Lactate (μM) CSF	Lactate (μM) Serum	Total Thiamine (nM) CSF	Total Thiamine (nM) Blood
Normal (± SD)	<1800	<2500	139 ± 43	183 ± 32
Pretreatment*	2560	3640	<10	64
Postreatment*	1860	1530	300+	364

*4 and 13 days after respiratory arrest.