

1570 USE OF PHENOBARBITAL FOR THE PREVENTION OF NEONATAL INTRACRANIAL HEMORRHAGE: A CONTROLLED TRIAL
Steven M. Donn, Dietrich W. Roloff, Gary W. Goldstein
University of Michigan Affiliated Hospitals, Departments of Pediatrics and Neurology, Ann Arbor, Michigan

We investigated the use of phenobarbital for the prevention of intracranial hemorrhage (ICH) in preterm infants with birth-weights less than 1500 gm. Thirty-five infants less than 6 hours of age were randomized to control or treatment groups. Treatment consisted of intravenous administration of phenobarbital 10 mg/kg upon admission and 12 hours later, followed by maintenance 2.5 mg/kg every 12 hours. Serum levels were maintained at 20-30 µg/ml. Therapy was stopped after the seventh day. Infants were evaluated for ICH by transillumination, cranial ultrasonography, computed tomography or post-mortem examination.

	Phenobarbital	Control
Number	14	21
ICH	1	8
%	7.1	38.1

p < 0.05

No differences could be found between the groups for birth-weights, gestational ages, Apgar scores, or other high-risk factors associated with ICH such as hypoxia, hypercapnia, acidosis, bicarbonate administration, alveolar rupture, hypotension and use of volume expanders. No adverse reactions to the phenobarbital were observed in any of the patients. We conclude that phenobarbital may effectively decrease the incidence of ICH in this population.

1571 DETECTION OF INTRACRANIAL CALCIFICATIONS IN NEONATES WITH CRANIAL ULTRASONOGRAPHY
Francine D. Dykes, Peter A. Ahmann, Anthony Lazzara (Spon. by James Schwartz), Emory University School of Medicine, Atlanta.

Intracranial calcifications comprise one of the hallmarks of congenital intrauterine infection. Rapid detection of such lesions could lead to earlier documentation of diagnosis with appropriate isolation, evaluation and treatment.

In a series of nine infants with signs and symptoms of congenital intrauterine infection and/or microcephaly, bedside cranial ultrasonography was performed prior to routine skull radiograph and CT brain scan with a linear array B-mode scanner. Presence of intraparenchymal and periventricular calcification ascertained by ultrasound in all nine infants was corroborated by CT brain scan. Skull x-rays were interpreted as normal in 3/5 infants.

Cranial ultrasound provides a sensitive reliable bedside alternative to x-ray studies for diagnosis of intracranial calcifications in newborns.

1572 CENTRAL NERVOUS SYSTEM LACTATE PRODUCTION AND CLEARANCE IN NEWBORN PUPPIES FOLLOWING 15 AND 30 MINUTES OF ASPHYXIA
William H. Edwards, Eugene E. Nattie* (Spon. by Robert Klein) (Depts. of Maternal and Child Health and Physiology, Dartmouth Med. School, Hanover, N.H.)

Recent studies have suggested that CSF lactate may be useful in assessing perinatal asphyxia. We studied lactate metabolism in spontaneously breathing newborn beagle puppies lightly anesthetized with 0.5% halothane and nitrous oxide. Lactate was measured in plasma, brain tissue and CSF following 15 and 30 minutes of asphyxia (F_{IO}₂ 2-5%; F_{ICO}₂ 7-8%) and 1 hour recovery. Experimental groups were compared to appropriate controls.

Asphyxia (min)	N	Lactate mmol/L or mmol/kg tissue (+ SEM)		
		Plasma	Brain	CSF
Control	6	2.5(0.4)	3.0(0.4)	3.5(0.3)
15'	5	13.2(1.8)	14.4(1.4)	7.6(0.9)
15' + 1hr recovery	5	4.3(0.8)	3.9(0.4)	7.0(0.6)
30'	5	23.4(1.4)	19.7(2.0)	14.4(0.5)
30' + 1hr recovery	5	10.1(1.9)	9.5(1.4)	13.8(1.6)

Plasma and brain tissue lactate rose to similar levels following asphyxia. Clearance of lactate by 1 hour was also similar for plasma and brain. CSF lactate rose to lower levels but was not cleared appreciably by 1 hour for either the 15 or 30 minute asphyxia group. The delayed clearance of CSF lactate may be useful clinically in assessing perinatal asphyxia. (Supported by HL 18351 and *RCDA HL 00364)

1573 TRANSCERPHALIC IMPEDANCE AND SERUM CREATINE KINASE BB IN PRETERM INFANTS AS PREDICTORS OF BRAIN DAMAGE.
Patricia H. Ellison, Winslow J. Borkowski, Medical College of Wisconsin, Milwaukee County Medical Complex, Department of Neurology, Milwaukee, WI.

As an indicator of brain damage in premature infants, we measured transcephalic impedance (TCZ) and serum creatine kinase BB (brain fraction-CK-BB) in 16 premature infants with gestational ages 24 to 32 weeks, all with birth weights less than 1500 grams. Both TCZ and CK-BB were measured within 24 hours and at weekly intervals. CK-BB values above 15 were considered abnormal (Becker and Menzel, 1978; Shields, 1979; Cuestas, 1980). TCZ values 2 standard deviations above normal were indicative of tissue damage from asphyxia (Ranck, 1964; Ellison, 1979), or IVH (Siddiqui, 1980). Persistently low TCZ, i.e. those under 30 ohms were considered to reflect delayed brain maturation (Ellison & Evers, 1980.)

13 infants had an elevated CK-BB during hospitalization. 10 infants had an elevated TCZ during the first postnatal week. 8 infants had both TCZ and CK-BB elevated. 4 infants had persistently low TCZ values associated with delayed maturation.

Of the 8 infants with elevation of both TCZ and CK-BB, 5 (63%) have moderate to severe neurological sequelae. 3 (37%) have mild neurological sequelae. 3 of the 4 infants with persistently low TCZ have developmental delay.

TCZ and CK-BB are accurate predictors of neurologic compromise in the preterm infant.

1574 CEREBROSPINAL FLUID LACTATE DEHYDROGENASE IN INTRA-VENTRICULAR HEMORRHAGE OF THE PREMATURE.
Stephen C. Engelke, Rita L. Saldanha, Arthur E. Kopelman (Spon. by William E. Laupus). East Carolina University School of Medicine, Department of Pediatrics, Greenville, NC.

Intraventricular hemorrhage (IVH) has been found to occur in as many as 50% of premature infants, but its presence does not correlate well with symptoms or with cerebrospinal fluid values. CSF lactate dehydrogenase (LDH) is elevated in adults with intracranial hemorrhage (Henry, 1979). The usefulness of CSF LDH as a possible indicator of the presence and severity of IVH was evaluated in 22 premature neonates, 10 of whom had IVH by computerized tomography (CT) scan. (3 Gr.I, 3 Gr.II, 1 Gr.III, 3 Gr.IV)

Spinal fluid LDH was significantly greater in the group with IVH, p<0.001 by the Mann-Whitney rank test. There was no overlap in the LDH values between the IVH and no IVH groups.

	N	LDH*	Range
IVH	10	510 ± 103	(72-1014)
No IVH	12	34 ± 5	(2- 64)

*mU/ml

In addition, the LDH values correlated well with the grade of IVH on CT scan. Other CSF and clinical parameters were analyzed and will be discussed. It is suggested that spinal fluid LDH may provide an index of the presence and severity of IVH in the newborn.

1575 VESTIBULAR RESPONSES TO CALORIC STIMULATION IN PREMATURE INFANTS AND THEIR CORRELATION WITH ACQUISITION OF HEAD CONTROL.
Lydia Eviatar (Spon. by Philip Lanzkowsky), Sch. of Med., Health Sciences Ctr., SUNY, Stony Brook, Long Island Jewish-Hillside Med. Ctr., Dept. of Pediatrics, New Hyde Park, New York.

Premature infants are often delayed in the acquisition of head and postural control even in the absence of neuromuscular deficits. Our previous studies have shown that vestibular responses to rotation and caloric irrigation are late to mature in prematures. 13 premature infants were followed prospectively for a period of 2 years with repeated neurodevelopmental evaluations and vestibular tests, recording oculo-motor responses to rotation and cold caloric stimulation by electronystagmography. 36 full term infants were recruited and followed simultaneously. None of the infants had evidence of neuromuscular dysfunction. The time of appearance and the quality of vestibular responses recorded were compared with the time when good head control in the sitting position was acquired. Delayed head control was found in all the infants who had either delayed appearance of vestibular responses to rotation, poor caloric responses bilaterally or only a unilateral response. Among the prematures, gestational age alone did not correlate well with the time of acquisition of head control. The incidence of delayed abnormal vestibular responses was much higher in the premature babies who, as a group, also had a higher incidence of delayed head control. An excellent time correlation was found between the recording of good vestibular responses to caloric stimulation and the acquisition of head control. The study suggests that the acquisition of head control in infants is largely dependent on appropriate information from the vestibular organs.