

**1147** INTRACRANIAL PRESSURE IN REYE'S SYNDROME. Milo D. Hilty, Earl S. Sherard, Carolyn A. Romshe, Hugo J. McClung and Ralph E. Haynes. Ohio State Univ. College of Medicine, Children's Hospital, Dept. of Pediatrics, Columbus, Ohio.

During the past 3 years the intracranial pressure (ICP) of 17 children with Reye's Syndrome (RS) has been monitored. The epidural monitor was placed in patients whose level of coma was III or deeper (Sherard Stages I-VI). The cerebrospinal fluid pressure or ICP was measured on 15 patients on admission to the hospital. The pressure was 200 mm H<sub>2</sub>O or less in 7 patients and 300 mm H<sub>2</sub>O or less in 13 patients. In survivors maximum ICP was recorded at 8-24 hours after admission and correlated with the level of coma. An ICP of 400-800 mm H<sub>2</sub>O was associated with coma level of IV or deeper. In one child the ICP was greater than 1300 mm H<sub>2</sub>O. In 8 patients abrupt increases in ICP to 700 mm H<sub>2</sub>O or greater occurred and preceded any clinical evidence of increasing ICP. These episodes lasted 20-30 minutes, and were treated with hyperventilation and/or mannitol. In 4 patients these episodes were repetitive, being separated by intervals of 2-12 hours. Most of our patients were admitted to the hospital during the early hours of their illness and were in Stage II or III coma. During this phase, the level of consciousness does not appear to be directly related to the ICP, however if the level of coma deepens during the next 24 hours after admission the ICP correlates with the stage of coma. Continuous ICP monitoring is essential for the optimal management of intracranial hypertension associated with RS and serves as an objective criteria for the administration of hyperosmolar agents in patients with coma Stage III or deeper.

**1148** EFFECTS OF ELEVATED BILIRUBIN AND PHOTOTHERAPY ON INFANT BEHAVIOR. K.J. Kazmaier, W.J. Keenan, J.M. Sutherland, Univ. of Cincinnati, Col. of Med., Dept. of Ped., Cincinnati.

Neuro-psychological effects of elevated serum bilirubin (Bili) and treatment with phototherapy (Rx) were studied in full term infants. The Graham/Rosenblith Neonatal Assessment Scales were administered at 12 hour intervals to infants throughout their hospital stay. Group I (n=12) had Bili <7mg%. Group II (n=18) had Bili >10mg% without Rx. Group III had Bili >10mg% and were treated from 7-85 hrs (X=39.6±6.5 hrs). Bili for Group III infants dropped from 14.4±.3mg% to 10.1±.6mg% post-Rx (t=6.68, p<.01). By post hoc analyses the groups appeared similar in all birth, maternal, and delivery characteristics evaluated. Age, amount fed, and time since feeding were significantly correlated with specific measures. Variance due to these uncontrolled factors were statistically removed for evaluation of differences between groups. Further adjustments were made for Bili to isolate effects of phototherapy treatment from those related to bilirubin alone.

Scores on general maturation items, muscle tension scores, limb extension responses, and strength of cry were lowered by Bili and apparently not further affected by Rx. Prolonged limb elevation increased in response to passive movement, and pitch of cry was lowered for treated infants and were not related to Bili. Severity of trembling was increased both by Bili and by Rx. Location of trembling responses and the types of stimuli eliciting trembling were increased by Bili and perhaps also by pre-delivery medication. Infant neuro-psychological behavior is significantly affected by hyperbilirubinemia and by treatment with phototherapy.

**1149** ALTERATIONS IN THE FUNCTIONAL ORGANIZATION OF THE STRIATE CORTEX OF THE NEWBORN MONKEY IN RESPONSE TO MONOCULAR VISUAL DEPRIVATION. Charles Kennedy, Michael Des Rosiers, Osamu Sakurada and Louis Sokoloff. Georgetown University School of Medicine, Department of Pediatrics, Washington, D.C. and National Institute of Mental Health, Laboratory of Cerebral Metabolism, Bethesda, Md.

Single cell recordings and anatomic studies of striate cortex in the monkey have shown that prolonged monocular visual deprivation begun in the second or third week of life results in alterations in cortical development. Specifically, the ocular dominance columns of the intact eye enlarge at the expense of those of the deprived eye (Hubel, D.H. et al 1976). We wished to learn the consequences of immediate postnatal occlusion of one eye and applied the (14-C) deoxyglucose autoradiographic method for measurement of local glucose utilization. This technique, devised in our laboratory, delineates the relative metabolic rates (and hence levels of functional activity) in the cortical layers and other cerebral structures. By patching one eye just before the experimental procedure we could demonstrate the ocular dominance columns in the newborn monkey. An animal which had had the lids of one eye sutured closed at birth was studied at three months of age. Autoradiographs of the striate cortex which depicted layer four very clearly showed it to be free of regular interruption or other evidence of the ocular dominance columns. In a comparable study of a mature monkey normal columns were found. We conclude that in the neonate plasticity permits the columns innervated by the deprived eye to be functionally displaced by those of the intact eye.

**1150** THE EFFECT OF BIRTH ASPHYXIA ON THE ETIOLOGY OF INTRAVENTRICULAR HEMORRHAGE (IVH). John D. Kenny, Joseph A. Garcia-Prats, James L. Hilliard, Anthony J.S. Corbet, Arnold J. Rudolph. Department of Pediatrics, Baylor College of Medicine, Houston.

To assess the effect of birth asphyxia on the development of IVH, arterial blood was obtained from a clamped segment of umbilical cord at birth from 60 premature infants of 26-36 weeks gestational age (GA) and analyzed for [H<sup>+</sup>], pCO<sub>2</sub>, standard bicarbonate (SB), and blood lactic acid (BL). IVH was diagnosed in 16 infants by sudden clinical deterioration, hemorrhagic CSF and typical neurologic signs. 15 of these died and autopsies were obtained on 10 which confirmed the diagnosis of IVH. Infants with IVH were less mature (IVH 29.3 weeks ± 0.4SE, no IVH 32.4 weeks ± 0.3SE, p<0.001), had lower one minute Apgar scores (IVH 2.1, no IVH 5.2, p<0.001), and had a higher incidence of HMD (IVH 12/16, no IVH 10/44, p<0.001). No differences were seen in any acid-base parameter except for SB which is related to the positive correlation between SB and GA (r = 0.35, p<0.025).

| Mean ± SE | [H <sup>+</sup> ] nM/L | SB mM/L  | pCO <sub>2</sub> mm Hg | BL mM/L |
|-----------|------------------------|----------|------------------------|---------|
| IVH       | 71.3±5.8               | 13.0±0.9 | 42.2±3.6               | 4.5±0.5 |
| no IVH    | 63.8±2.2               | 15.9±0.5 | 41.5±1.4               | 4.0±0.3 |
| P         | >0.2                   | <0.01    | >0.8                   | >0.3    |

We conclude that birth asphyxia does not occur more frequently in premature infants who subsequently develop IVH and that the decreased Apgar score in infants with IVH is related to their immaturity and higher incidence of HMD.

**1151** BRAIN LEAD LEVELS IN HEMORRHAGIC LEAD ENCEPHALOPATHY. Joseph A. Kochen and Yigal Greener, Albert Einstein Coll. Med., Montefiore Hosp. & Med. Ctr., Dept. Ped., The Bronx, NY

Lead (Pb) encephalopathy in the newborn rat is characterized by hemorrhage restricted to the cerebellum. This was produced by giving 7 day old rats 0.5ml 1% <sup>210</sup>Pb-acetate by gastric tube daily x 7. This resulted on day 14 in significantly higher Pb levels in the cerebellum than cerebrum (10.1 ± 4.0 vs 5.0 ± 1.2 µg Pb/gm) (M ± SD). Since red blood cells (RBC) contain much Pb, it was unclear whether the higher cerebellar levels reflected extravasation of RBC or increased capillary permeability to Pb. This was resolved by labelling RBC by prior injection of <sup>59</sup>Fe and quantitation of RBC trapping in brain. Pb administration resulted in a significant increase in RBC sequestration in the cerebellum (from control levels of 10.1 ± 1.1 to 49.3 ± 27.8 µl RBC/gm), but little change in the cerebrum (from 9.5 ± 1.0 to 10.9 ± 1.1 µl/gm). This increased retention of RBC accounted for 62.7 ± 24.2% of the Pb in the cerebellum and 29.1 ± 7.9% in the cerebrum. The remaining Pb represented the actual concentration of Pb in cerebellum (3.6 ± 2.4 µg/gm) and cerebrum (3.6 ± 0.9 µg/gm). Thus, the level of Pb in hemorrhagic regions of the brain proved to be identical to that in unaffected regions. The restriction of hemorrhage to the cerebellum despite the uniform distribution of Pb in the brain indicates that the cerebellar capillaries are particularly vulnerable to the toxic effects of Pb.

**1152** VISUALLY-ELICITED FINGER EXTENSION IN INFANTS: REFLEX OR REACHING? Iris McGuire & Gerald Turkewitz (Spon. by L. Gartner), Albert Einstein College of Medicine, Department of Pediatrics, Bronx, New York

Arm and finger movements commonly observed in young infants may be neither responses to internal stimuli, nor attempts to "reach for" objects, but reflex-like responses to stimulation from objects. Schneirla's Approach-Withdrawal Theory proposes that at early stages of development in all animals, low intensities of stimulation evoke approach responses and high intensities evoke withdrawal. This hypothesis was tested in 26 human infants by observing their finger responses to a cone that varied in intensity. It was near or far, large or small, bright or dim, with eight combinations from low (far-small-dim) to high (near-large-bright) intensity. Finger movements (flexion or extension) were recorded and ratios of extensions/flexions + extensions computed. There were significant age, intensity, and age x intensity effects with younger infants' (10-15 weeks) responses clearly related to intensity, while older infants' (20-25 weeks) responses were not. Younger infants made more extensions (approach) to low intensity stimuli, and more flexions (withdrawal) to high intensity stimuli, their extension ratios following an inverse intensity gradient. Such reflex-like responses in very young infants may contribute to the development of reaching by bringing the hands and other objects into the visual field so that intersensory integration can occur. The development of reaching may thus be facilitated by presenting infants stimuli that effectively elicit approach responses.