1663

EXTRAUTERINE BRAIN MATURATION IN PRETERM NEONATES. Benjamin Chayen, Uma L. Verma, Nergesh Tejani.

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Recent reports suggest that the cerebral function monitor (CFM), a system of integrated EEG accurately reflects cerebral maturational changes associated with gestational ages of both appropriate-for-gestational age (AGA) and small-for-gestational age (SGA) neonates. This study describes the use of CFM to evaluate extrauterine brain maturation in 25 normal preterm AGA neonates. Gestational age (GA) of these neonates varied from 26-34 weeks. All of the neonates had an Apgar score of > 6 at five minutes, normal serial cranial sonograms, and absence of any clinical evidence of cerebral hypoxia. Each neonate was evaluated by the CFM at birth and serially thereafter. The characteristics of the cerebral activity during quiet sleep (S1) were used to assign a GA for each CFM evaluation. Comparison of the actual GA at birth assessed by obstetrical and neonatal parameters and the CFM estimate of GA showed no difference ($P > 0.3$). Similarly, comparison of the postnatal age and the increase in maturation by CFM showed no difference ($P > 0.4$). We conclude that extrauterine brain maturation of the normal preterm AGA neonate is temporally concordant with intrauterine maturation as judged by the CFM.

1664

VISUAL EVOKED POTENTIALS (VEPs) IN NORMAL NEONATES. Kwei Chin, Margot Taylor, Rosemary Menzies, Hilary Whyte. (Spon. by P.R. Swyer) Research Institute,

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Visual evoked potentials have been shown to change with CNS maturation in children. The VEPs have not been utilized in investigating the maturational changes in premature infants due to technical difficulties. However, using light emitting diode goggles and a compact signal averager, VEPs can be recorded easily and reliably within the intensive care setting. Forty neurologically normal infants of 23-43 weeks gestation were studied. Two or more averages, each of 64 trials, were collected to ensure reproducibility.

In all infants a negative wave was present with a mean latency of $308 \text{ msec} \pm 21 \text{ msec}$ (N300). This was the only wave present in infants between 24 and 31 weeks gestation. After 32 weeks an early positive wave began to emerge. This wave had a latency of $220 \text{ msec} \pm 22 \text{ msec}$ (P200). This was present, consistently followed by the negative wave, in all infants from 37 weeks onwards.

The consistency of the N300 after 23 weeks suggests that it arises from the basilar dendrites which undergo little further maturation to term. The positive wave is suggested to arise from the apical dendritic branches which develop over the last trimester, and may explain the emergence of the P200 from 32 weeks onwards. These data indicate that the LED technique can be used to confirm gestation and follow sequential maturation.

† 1665

A CHARACTERISTIC EEG PATTERN IN MULTIFOCAL CEREBRAL WHITE MATTER NECROSIS. R. Coen, R. Bejar, E. Novotny, B. Tharp, J. Hanley, N. Thompson, J. Jacobowski.

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Surface positive sharp waves (PRS) in central (Rolandic) regions of the premature infant's electroencephalogram (EEG) were associated with intraventricular hemorrhage (IVH) in 1972. Later studies using CT scans confirmed the PRS-IVH relationship. Current studies with real time echoencephalography (RTE) and autopsies suggest PRS are associated with multifocal necrosis (MFN) of the cerebral white matter in the presence or absence of IVH. MFN was diagnosed in 30 premature infants. The number of infants with PRS positive EEG's were as follows:

	IVH- (GRADE)			
	0	I-II	III-IV	Total
MFN	11/11	5/8	5/7	21/26
No MFN	-	0/1	0/3	0/4

PRS were present during the progressive phase of MFN which appears on RTE as paraventricular echodensities and emerging cavitations. No PRS were observed when cavitations remained focal or were resorbing. RPS were recorded from the central vertex (Cz) electrode in nearly all cases.

In summary, PRS on a preterm infant's EEG suggest the need for serial EEG and RTE evaluations to determine the presence and evolution of cerebral white matter necrosis, even if IVH is present.

1666

ACUTE PARAINFECTIOUS PARKINSON'S SYNDROME: CSF FINDINGS OVER ONE YEAR. Joan A. Conry, W. Edwin Dodson. George Washington University School of Medicine, Children's Hospital National Medical Center, Washington D.C., and Washington University School of Medicine, St. Louis Children's Hospital, St. Louis.

We describe the clinical course, CSF catecholamine metabolites and immunoglobulins, and radiographic changes over 1 year in a case of acute parainfectious Parkinson's syndrome. Seven days after the onset of a viral syndrome, a 7 year old developed bradykinesia, rigidity, and involuntary movements. By 5 weeks, clinical improvement began. At 1 year, subtle basal ganglia and cerebellar signs were present. Acutely the CSF IgG/albumin ratio was at upper limit of normal (.27, normal 0-.27) and the IgG index (CSF IgG/albumin ratio $\div$ serum IgG/albumin ratio) rose from .68 (day 12) to .96 (day 20) then returned to .42 (normal 0-.68). Attempts to identify a viral agent were unsuccessful. CSF catecholamine metabolites acutely showed markedly decreased homovanillic acid (HVA) (15.8 ng/ml, normal 91 $\pm$ 43.5) and slightly reduced 5-hydroxyindoleacetic acid (5-HIAA) (15.3 ng/ml, normal 43.9 $\pm$ 21). By 13 months the HVA returned to 43.6 ng/dl and 5-HIAA was 11.0 ng/ml. CT scan initially showed lucencies in the caudate and globus pallidus and generalized atrophy; by 1 year, only diffuse atrophy, marked in the cerebellum, was seen. The CSF immunoglobulins are suggestive of an inflammatory process. The CSF catecholamine metabolites and the CT findings correlate well with the clinical course. The association between clinical abnormalities of tone and decreased dopamine metabolites (HVA) is similar to findings in adult patients with Parkinson's Disease.

† 1667

QUANTITATIVE MEASUREMENT OF NORMAL NEUROLOGICAL MATURATION IN SCHOOL-AGE CHILDREN, David L. Coulter, (Spon. by Randall M. Goldblum, M.D.)

Children with developmental disabilities such as attention deficit disorder, hyperactivity and dyslexia are often found to have "soft signs" on neurological examination. These "soft signs" are believed to represent abnormal persistence of findings that would be normal at a younger age. This concept of delayed maturation implies that there is a normal maturational sequence for development of these skills. There is very little quantitative data describing normal neurological maturation in school-age children, however. Such normative data would be essential for a meaningful interpretation of "soft signs." Age-specific normal maturational sequences will be presented for the following neurological tasks: face-hand test, finger differentiation, finger identification, right-left identification, crossed commands, tandem walking, balancing on one foot, hopping on one foot, absence of overflow, finger to thumb and several types of rapid alternating movements. For each task the age at which 25%, 50%, 75% and 90% of normal children can accomplish it will be shown. These data have been organized into a chart, similar to the Denver Developmental Screening Test, on which clinicians can relate an individual child's performance to these age-specific norms. This chart should be useful in future quantitative studies of the maturational delay hypothesis in developmentally disabled children.

1668

FOLLOW-UP OF INFANTS WITH NEONATAL ABSTINENCE-RELATED SEIZURES. Tatiana M. Doberczak, Rhoda Cutler, Joanna A. Loucopoulos, Stephen R. Kandall, (Spon. by Walter Henley) Depts. of Pediatrics and Psychology, Beth Israel Medical Center, New York.

Eighteen passively addicted infants who exhibited abstinence-related neonatal seizures were evaluated for periods up to one year of age. Seven mothers were maintained on methadone alone, 10 used methadone and other drugs, and one used heroin and cocaine during pregnancy. Thirteen seizures were myoclonic, 2 were generalized, and 3 were tonic-clonic in type. Thirteen of the initial EEGs performed 2-48 hours following onset of seizures were abnormal; the remaining five EEGs were normal. Of the 13 abnormal EEGs, 11 reverted to normal within 14 days, while 2 remained abnormal.

Bayley Developmental Assessment in infant subsets at 3 months of age showed an MDI (Mental Developmental Index) of 109 ± 11.6 (SD) and PDI (Psychomotor Developmental Index) of 107.2 ± 11.5 . MDI and PDI at 6 months of age were 98.6 ± 20.1 and 111.8 ± 12.1 ; MDI and PDI at 12 months of age were 106 ± 0 and 98.5 ± 0.7 .

Neurological examinations were normal except for hypertonicity in 7 of 13 infants seen at 3 months of age; 2 of those babies were normal at one year of age, while the remaining 5 await re-evaluation. Although developmental assessment appears to be normal, ongoing neurologic evaluation of these infants is necessary.