

**31** TWO YEAR DEVELOPMENTAL PERFORMANCE IN INFANTS 24-28 WEEKS GESTATION. J. Astbury, A.A. Orgill, B. Bajuk & V.Y.H. Yu. Dept. of Pediatrics, Queen Victoria Medical Centre, Melbourne. Sponsored by Margaret L. Williams.

All surviving infants of 24-28 weeks gestation born at the QVMC between 1977-80 were scheduled for developmental assessment at two years of age, corrected for prematurity. Of the 80 survivors 72 were assessed on the mental (MDI) and psychomotor (PDI) and the Infant Behaviour Record (IBR) of the Bayley Scales of Infant Development. Children of 24-26 weeks gestation were compared with those of 27-28 weeks on the incidence of physical disabilities and performance on the Bayley Scales. Infants of shorter gestation (24-26 wk) had significantly more major and minor physical disabilities than those of longer gestation (27-28 wk)  $p < .002$ . There were no significant differences between the two groups on either the MDI or PDI. Performance on the MDI, but not on the PDI, was however significantly affected across the whole 24-38 wk gestation range by infant behaviour and occupational status of the father. Analysis of variance revealed that children with abnormal orientation to tasks had significantly lower MDI scores (85.6) than children with normal orientation to tasks (102.2)  $p < .001$ . Similarly, children whose father's occupational status on the Congalton scale was below the median had significantly lower MDI scores (90.3) than those above (98.5)  $p < .05$ . There was no significant interaction between infant behaviour and father occupation. These results indicate that infant behaviour is the most important determinant of mental performance at two years of age for this group of 24-28 week gestation infants.

**32** FORMULA CHANGE REDUCES CRYING BEHAVIOR: EVIDENCE FOR ROLE OF INTRAIESTINAL GAS. Ronald G. Barr, Judy A. Wooldridge, James Hanley, Lee Jajko, & Christiane Boisjoly (Spon. by Michael S. Kramer). McGill Univ., Montreal Children's Hosp., Dept. of Pediatrics, Montreal, Canada.

To study the role of intrainestinal gas production in mediating the effects of formula changes on crying behavior, 17 normal 4-wk-old infants entered a feeding trial consisting of 5 four-day feeding periods (FP). Following baseline (FP0) on cow's milk-based lactose formula, infants received equivalent lactose (L) or reduced lactose (RL) soy-based formulae in a double-blind double crossover design (FP1-4). Parents blind to the specific study hypothesis recorded 6 behaviors (including cry/fuss) by pretested diaries. To monitor gas production, breath  $H_2$  samples were taken over 4 hr on day 4 of each FP. Duration and frequency of cry/fuss and average 4-hr  $H_2$  values were calculated for L vs. RL conditions and for each feeding period.

There were no differences in cry/fuss measures between L and RL formulae. However, breath  $H_2$  declined significantly across periods (mean (ppm): FP0 32; FP1 15; FP2 7; FP3 7; FP4 15; ANOVA F4, 55 = 5.69;  $p < .001$ ) followed by a similar significant depression in cry/fuss duration (mean (min/24 hr): FP0 137, FP1 154, FP2 123; FP3 108; FP4 124; ANOVA F4, 62 = 3.04;  $p = .02$ ; FP0,1 > FP2,3,4 Tukey  $p < .05$ ). There was no difference in cry/fuss frequency across periods.

**Conclusion:** Change from cow's milk to soy-based formula suppresses gas excretion and reduces duration of cry/fuss behavior. Formula changes may lessen cry/fuss behavior by the mechanism of transient suppression of intrainestinal gas production.

**33** RISK FACTORS ASSOCIATED WITH HEARING IMPAIRMENT IN NEONATES Donna L. Berbling, Richard L. Bucciarelli, F. Joseph Kemker (Spon. by Donald V. Eitzman) U. of Fla., Coll. of Med., Depts of Pediatrics and Speech and Hearing, Gainesville, FL

Beginning January, 1983, a comprehensive hearing screening program for all infants less than 28 days of age was initiated. 487 infants at risk for hearing impairment were screened using a list of 20 risk criteria. Infants are classified as high risk when they meet one or more of the risk criteria. Testing involves Behavioral Observation Audiometry (BOA), Tympanography (Tymp) and Auditory Brainstem Response (ABR). Hearing impairment was diagnosed when the infant failed BOA, or ABR on two occasions. Any infant who failed Tymp received otologic exam to rule out middle ear disease. To date 440 infants were classified at high risk and 214 have been tested. 8 (3.8%) have been diagnosed as hearing impaired. The most frequent risk factors to appear in the 8 hearing impaired infants were a birthweight <1500gm (6/8), evidence of intracranial hemorrhage (7/8), and aminoglycoside exposure  $\geq 7$  days (5/8). No infant who passed hearing screening has been subsequently diagnosed as hearing impaired during developmental follow-up. This data suggests that a comprehensive neonatal hearing screening program can identify hearing impaired infants in the neonatal period. Although many other factors have been considered as high risk, birthweight <1500gm, presence of intracranial hemorrhage and aminoglycoside exposure seem to be the most important risk factors.

**34** THE EFFECT OF HOME MONITORING FOR APNEA. R. Debra Bendell, Mary A. McCaffree, Cynthia Mattice. (Spon. G.B. Humphrey). Depts. of Pediatr. and Psychiatry and Behavioral Sciences, Univ. of Okla. Health Sci. Center, Okla. City.

Longitudinal adjustment of families (n=86) to the impact of an apneic infant and a home monitoring system was examined utilizing a 28-item questionnaire administered during follow-up evaluations at six to eight months of age, over a 3-year period. Marital relationships remained the same for 50% of the families, 30% of the families felt the relationship was strengthened, while the remaining 20% felt the relationship worsened. None of the families were separated or divorced. These findings contrast with reports which indicated strained and worsening marital relationships. The apneic infant and monitoring system impacted significantly on job attendance, social life and anxiety levels. ( $p < .01$ ) Parents perceived conflict between grandparents, relatives and babysitters who were distanced, fearful and unwilling to assume primary (even short-term) responsibility for infant care, and felt overwhelmed by the responsibility for total infant care. Parental anger was focused on the monitor and apneic events and not on the infant. These findings indicate the importance of support and follow up for families with apneic infants who are on home monitoring systems.

**35** OUTCOME FOR SURVIVORS OF PERSISTENT PULMONARY HYPERTENSION (PPH). E. M. Bifano and A. Pfannenstiel. SUNY, Upstate Med. Ctr., Syracuse, NY. Spon. M. L. Williams.

Limited information is available regarding the developmental outcome of survivors of PPH.

Of 36 infants admitted with PPH in 1979-1982, 26 survived. Twenty-one were evaluated at 4, 8 and 12 mos. of age by physical exam, neuromuscular testing and Bayley Scales of Infant Development. The mean MDI was  $106 \pm 18.9$  (median 102) and mean PDI was  $90.8 \pm 18.1$  (median 91). Ten infants were normal (47.6%) and 11 infants (52%) had mild to severe developmental abnormalities. Of the abnormal infants 7(33%) had an MDI and/or PDI 1 S.D. below the mean and a mild neuromuscular abnormality. Four(19%) had an MDI and/or PDI 2 S.D. below the mean and/or severe neuromuscular deficit. Two infants had chronic lung disease and growth failure. In review of neonatal data on the normal and abnormal infants, there was no difference in birthweight, race, sex, number inborn, lowest  $paO_2$  and pH, highest  $paO_2$ ,  $pCO_2$  and pH. However the abnormal infants spent a significantly greater number of hours with  $pCO_2 < 25$  than the normal infants,  $120 \pm 62$  vs  $60 \pm 73$ . ( $p < .01$ ).

This result is in variance with previous reports of generally good developmental outcome in infants made hypocapnic during PPH and suggests that caution in applying hyperventilation is warranted until further data are available.

**36** PREDICTORS OF INGESTIONS, HEAD INJURIES AND BURNS FROM BIRTH TO FIVE. Polly E. Bijur, Jean Golding, Neville R. Butler, Sarah Stewart-Brown, David Rush. Albert Einstein College of Med., Dept. of Pediatrics, Bronx, NY; University of Bristol, Dept. of Child Health, Bristol, UK.

In order to assess whether there are common behavioral and environmental factors associated with different types of accidents, we have compared the independent contributors to three types of accident. Accidents needing medical care were reported in a standardized parent questionnaire that provided extensive social data on a representative sample of 11,966 British children.

Simultaneous multiple regressions showed that the following characteristics were independently associated with each type of accident (variables are listed in order of their contribution). Ingestions: child's antisocial behavior, mother's depression, young mothers, part-time work, older siblings, number of moves, full-time work, uncrowded housing; Severe head injuries (e.g., depressed skull fracture): breath holding/fainting, younger siblings, young mothers, number of other accidents; Mild head injuries (e.g., scalp laceration): male sex, mother's depression, young mothers, non-neurotic child behavior, number of moves, part-time work, full-time work; Burns: mother's depression, crowded housing, sleep problems, male sex, low social class, older siblings, short-term hearing problems.

The data suggest that common interpersonal factors exist, as maternal depression and youth are associated with three of four types of accident. However, there are likely to be environmental and social factors that are specific to each type of accident.