

49 FACTORS ASSOCIATED WITH NEURODEVELOPMENTAL OUTCOME OF INFANTS WITH BRONCHOPULMONARY DYSPLASIA (BPD). Marta H. Lifschitz, Dan K. Seilheimer, Geraldine S. Wilson,

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Fifty premature infants with BPD were studied to determine the factor(s) affecting neurodevelopmental outcome. Mean birth weight was 1055 gm and mean gestational age was 28 wks. Twenty-six subjects remained in the hospital for oxygen therapy, while 24 were discharged for home care while receiving supplemental oxygen. At a mean age of 20 mos. (+10) a large number of infants remained below the 5th%tile (28 in wt; 23 in ht; 20 in FOC). Mean Developmental Quotient (DQ) was 66 (range 30-106). 17 (34%) had abnormal neurologic exams (CP, Sz, hydrocephaly, visual or hearing impairments). Neonatal variables, morbidity and course of BPD were correlated with DQ and neurological score (N1=0; Susp.=1; Abnl=2) and the significant variables identified were submitted to multiple regression analysis. Factors associated with DQ were pneumothorax (PTX) (Coef. +S.D.=-17.6+6.2, p<0.01) duration of hospitalization (-0.1+0.03, p<0.01) and intracranial hemorrhage (-4.1+1.9, p<0.05). Mean DQ for patients with pneumothorax was 51±15 vs. 70±21 for those infants without PTX (p<0.002). Neurologic outcome was also related to pneumothorax (0.8+0.2, p<0.01), duration of hospitalization (0.002+0.001, p<0.05), and race (p<0.001). **Conclusions:** Chronic BPD is an important morbidity factor associated with poor growth and neurodevelopment. Pneumothorax is the single most predictive factor. Home care did not significantly influence outcome. These results emphasize the need for careful monitoring of ventilation to prevent pneumothorax as an effort to improve outcome.

50 THE PSYCHOLOGICAL IMPACT OF NEAR-MISS SIDS

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Research has demonstrated that Sudden Infant Death Syndrome (SIDS) is emotionally devastating to families. An episode of apnea occurring at home requiring resuscitation is commonly referred to as near-miss SIDS. The relationship between near-miss SIDS and SIDS is unclear, and the effect upon the family has been less well defined. 40 families who had experienced a near-miss SIDS episode responded to a questionnaire, 25 in writing and 15 by telephone. The questionnaire was completed 1 to 38 months after the episode. 37 of the respondents were present when the apnea occurred. 33% of the caretakers checked the baby as part of their routine activity, and 18% had a premonition that something was wrong and went to check the baby. 63% described it as "one of the hardest things in my life." 10% described the experience as similar to a death in the family. Only 5% believed that their baby would have survived without resuscitation and 63% believed that their baby would die without intervention. As a result of this episode 20% decided not to have any more children, but half of these later reconsidered this decision. The average duration of time before things returned to normal was 3.7 (S.D. ± 3.8) months. These findings suggest that there is a significant psychological impact as a result of a near-miss SIDS episode, consistent with post-traumatic stress disorder, and that support services should be available to the family.

51 PREMATURETY AND CHRONIC PULMONARY DISEASE: DEVELOPMENTAL EFFECTS IN THE FIRST YEAR OF LIFE. Philip I. Markowitz, Kathryn W. Kerkering, Patricia A. Jarvis,

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The developmental effects of prematurity are still unclear. In part due to sample heterogeneity regarding severity of illness. We studied a medically more homogeneous population, 22 infants with bronchopulmonary dysplasia (BPD). Medical risk was assessed by obstetrical, neonatal and pediatric complications scales as well as the requirement for mechanical ventilation, supplemental oxygen and hospitalization. Development was examined with the Bayley Scales of Infant Development at 4, 8 and 12 months age, corrected for degree of prematurity. Mean Mental Developmental Index increased from 76.7 at 4 months to 81.5 at 12 months. Mean Psychomotor Developmental Index decreased from 82.0 to 65.4 (MDI vs PDI 12 mos, t=4.59, p<.0007). Outcome was not related to gestational age or birthweight, nor severity of perinatal complications. Outcome was related to severity and chronicity of illness as measured by days requiring supplemental oxygen (r=-.53, p<.05) and total duration of hospitalization (r=-.65, p<.01). Social factors were also predictive with lower maternal age (r=-.57, p<.03) education (r=-.56, p<.03) and social class (r=-.61, p<.02) all relating to weaker mental development.

The data suggest that motor development during the first year is more compromised by the combination of prematurity and chronic pulmonary disease than is mental development and that motor development worsens. Frequently examined medical risk factors are not predictive of outcome, while measures reflecting severity and chronicity of illness are.

52 WHO IS REALLY DEVELOPMENTALLY AT RISK AMONG VERY LOW BIRTHWEIGHT INFANTS? Cecelia M. McCarton and Ina F. Wallace, (spon. by George Schwartz), Albert Einstein College of Medicine, Bronx, N.Y.

We studied the neurobehavioral development of 78 very low birthweight (VLBW) infants (< 1500 gms), beginning with the 1st week of life and continuing to 3 years of age. From birth through 40 weeks post-conceptual age (PCA) we used the Einstein Neonatal Neurobehavioral Exam (ENNBAS); from 40 weeks PCA to 2 years of age we used the Bayley Scales; in the third year we used the Stanford-Binet. The VLBW infants were divided into three age and weight-matched groups: 1) 12 infants with perinatal asphyxia (PNA) determined by an Apgar score of ≤ 4 at 5 minutes; 2) 14 infants with severe respiratory distress (RDS), requiring assisted ventilation for > 3 days (x̄=10 days), and 3) 52 healthy preterm infants without PNA, RDS, biochemical abnormalities, CNS infections or seizures. We found that: 1) during the preterm period, healthy VLBW infants and those with PNA develop equally well, and both do significantly better than RDS babies on all measures of visual, auditory and motor development; 2) from 40 weeks PCA to 3 years of age, healthy VLBW infants and those who had PNA consistently perform within normal standards on all tests of neurobehavioral development. VLBW infants who had RDS do significantly worse. We conclude that; 1) a short term respiratory insult (PNA) has very different developmental effects than a longer duration insult (RDS); 2) disturbances in neurobehavioral development which persist for up to 3 years may be detectable as early as the preterm period in certain groups of VLBW infants; 3) the "healthy" VLBW infant in our cohort develop normally through the third year of age.

53 EFFECTS OF ILLNESS ON THE NEUROBEHAVIORAL COMPETENCE OF PREMATURE INFANTS. Barbara J. Myers, Philip I. Markowitz, Patricia A. Jarvis, and Kathryn W.

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The neurological effects of prematurity are still poorly understood, in part due to failure to adequately control for severity of illness. We examined with the Brazelton Neonatal Behavioral Assessment Scale the neurobehavioral competence of 15 infants with bronchopulmonary dysplasia (BPD), 13 infants with respiratory distress syndrome (RDS), and 8 well premature infants (WP), matched except for severity of illness. Exams occurred at term and only if infants were medically stable. Supplemental oxygen, if needed, was delivered by nasal cannula. Significant group differences occurred in the area of interaction and alertness (p<.05). Performance was best for the WP group and worst for the BPD group. In the BPD group significant correlations with subscales measuring physiologic stability occurred with obstetrical complications (r=-.60, p<.02), neonatal complications (r=-.72, p<.003), gestational age (r=-.64, p<.01), birthweight (r=-.69, p<.005), and Apgar1 (r=.60, p<.03). Neurobehavior in the RDS infants related only weakly to medical factors and not at all in the WP group. Our data suggest that perinatal events influence neurobehavioral competence but only in more severely involved infants. This may be due to neurological insult or on-going illness. Degree of prematurity does not directly affect behavior as infants in the 3 groups were equivalent in this regard. Rather, degree of prematurity is influential because of the increased likelihood of medical complications.

54 TWO-YEAR FOLLOW-UP OF BRONCHOPULMONARY DYSPLASIA AND INTRACRANIAL HEMORRHAGE IN ≤1,200 GM INFANTS

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Long-term neurodevelopmental sequelae of chronic disorders such as bronchopulmonary dysplasia (BPD) have not been well-documented in relation to acute perinatal insults such as intracranial hemorrhage (ICH). To study this relationship in ≤1,200 gm infants, the present study used repeated ultrasonographic scans at bedside to detect ICH prior to hospital discharge, and defined BPD as more than 3 wks of ventilation. 68 ≤1,200 gm infants born between 4/14/80 and 4/14/83 were followed through at least 12 mo. of age, with 48 infants tested thus far at 24 mo. (corrected for prematurity). Mean Bayley mental and motor scores at 12-24 mo. were:

	(A) 12 mo.		(B) 18 mo.		(C) 24 mo.		N
	Mental	Motor	Mental	Motor	Mental	Motor	
ICH-BPD	83.6	78.2	84.6	77.8	82.0	79.7	12,10,10
ICH-nonBPD	93.8	83.4	90.7	86.9	91.4	83.7	20,19,19
nonICH-BPD	83.9	78.5	84.7	79.6	95.8	81.3	16,12,6
nonICH-nonBPD	98.7	97.8	94.1	99.9	85.2	92.1	20,15,13

Both ICH groups included 4 grade III-IV survivors. A repeated-measures ANOVA revealed significantly poorer mental and motor performance by BPD infants through 18 mo. of age (ps<.02). ICH resulted in poor motor performance, but just in nonBPD infants (p<.05). Only BPD substantially depressed mental scores (p<.05).