

As you read this abstract, you will want to be aware that the definition of pneumothorax is an accumulation of air or gas in the space between the lung and chest wall, resulting in partial or complete collapse of the lung.

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Adverse Neurodevelopmental Outcomes Among Extremely Low Birth Weight Infants With a Normal Head Ultrasound: Prevalence and Antecedents

Objective. Severe abnormalities of the head ultrasound (HUS) are important predictors of cerebral palsy (CP) and mental retardation, and a normal HUS usually ensures the absence of major impairments. With the increasing survival of extremely low birth weight (ELBW) infants (birth weight <1000 g), the prognostic significance of a normal HUS may differ. This study examined the prevalence of and risk factors for CP and impaired mental development among ELBW infants with a normal HUS.

Methods. Study infants were ELBW infants who were cared for in Neonatal Research Network centers in the years 1995–1999, had a normal early and late HUS, survived to discharge, and returned for follow-up assessments at 18 to 22 months' corrected age. The outcomes of interest were a score <70 on the Bayley Scales of Infant Development-II Mental Developmental Index (MDI) and CP. Risk factors included maternal demographics; infant characteristics; and interventions or morbidities related to the lung, infection, and nutrition. Logistic regression was used to estimate odds ratios (ORs) and 95% confidence intervals (CIs). A time-oriented approach was used to select variables for inclusion in logistic models.

Results. Of 1749 infants with a normal early and late HUS (performed at a mean age of 6 and 47 days, respectively), 1473 (84%) returned for follow-up assessment. Infants had a birth weight of 792 ± 134 g (mean \pm SD) and gestational age of 26 ± 2 weeks. Rates of CP and MDI <70 were 9.4% and 25.3%, respectively, and 29.2% of infants had either CP or MDI <70. In multivariate analyses, factors associated with CP were male gender (OR: 1.8; 95% CI: 1.2–2.6), multiple birth, (OR: 1.6; 95% CI: 1.1–2.5), decreasing birth weight (OR: 1.3 for each 100-g decrease; 95% CI: 1.1–1.5), pneumothorax (OR: 2.3; 95% CI: 1.2–4.4), and days of conventional ventilation (OR: 1.2 for each additional 10 days; 95% CI: 1.1–1.3). With the exception of pneumothorax, these same factors were associated with MDI <70, in addition to less maternal education (OR: 1.4; 95% CI: 1.0–1.9) and Medicaid or lack of coverage for maternal insurance (OR: 1.7; 95% CI: 1.2–2.4).

Conclusions. Nearly 30% of ELBW infants with a normal HUS had either CP or a low MDI. Risk factors that are associated with this high rate of adverse outcomes include pneumothorax, prolonged exposure to mechanical ventilation, and educational and economic disadvantage. Improvements in pulmonary care to reduce duration of ventilation and avoid air leaks might improve neurodevelopmental outcome for ELBW infants.

I found this to be an interesting article as it speaks to the discussion we had about premature infants and the description of them on the diagnosis list last year. We talked about what factors in the NICU influence the developmental status of infants as they grow. In the study I did of premature infants that received early intervention, the length of time on a ventilator and the intraventricular hemorrhage grading were the only two predictors of eligibility in the second year of the infants in the study. They were weak predictors but those were the only ones.

This article is saying that premature infants with a normal head ultrasound or no intraventricular hemorrhage have a risk of having a motor developmental delay or cerebral palsy. Just qualifying premature infants with an intraventricular hemorrhage would leave this population out and would have the potential of not serving infants who need early intervention.

Here is another reason that using characteristics of premature infants at discharge is hopefully, a good way to decide who to serve.

The other interesting aspect is the risk factor of educational and economic disadvantage. This correlated with a motor delay more than cerebral palsy and is seen in many other studies about premature infants. Even though we do not use economic status for eligibility, it is significant that it is a contributing factor to the development of the premature infant.