

In conclusion, an SFR offers hope for reducing the risk of NEC by decreasing variability in practice. SFRs should address variability in both medical and nursing practice. Implementation strategies that comprise processes aimed to improve the clinician's compliance with the recommendations will determine the extent to which they are useful. It is imperative, however, that clinicians understand the values driving research, outcomes, and management issues. If clinicians lack this understanding, then ethical conflict or dilemmas could ensue which may impede the adoption of the SFR. In addition, SFRs may not be appropriate for all low birthweight infants, hence, clinicians need to exercise judgment otherwise they may compromise the infant's care. Future studies need to measure the relative effectiveness of the SFR. Emphasis on effectiveness will allow the researcher to evaluate the utility of the SFR in practice, process of care, quality of care, and patient/parent satisfaction.²¹

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Encephalopathy

Prevalence, causes, and outcome at 2 years of age of newborn encephalopathy

N Marlow, H Budge

A commentary on the article by Pierrat *et al*

Regional population based studies of infants who suffer from intrapartum hypoxia are rare, and Pierrat and colleagues are to be congratulated on such a study. As always it is easy to criticise such studies because case definition is so difficult, and, without accurate imaging and detailed case evaluation, it is difficult to be sure that a neonatal encephalopathy is due to hypoxia. The definition of perinatal hypoxia-ischaemia that they have used might be viewed as inclusive and is at variance with the template for intrapartum causation for cerebral palsy, which

requires evidence of an intrapartum event.¹ Without detailed evaluation of each case, it is difficult to be certain of the timing of the cause.

In the literature, most outcome evaluations of neonatal populations have studied very preterm infants, and there have been only a few population studies of neonatal encephalopathy. The birth prevalence of encephalopathy reported in this paper is in keeping with the results of the Trent Neonatal survey (Department of Health Sciences, University of Leicester, Leicester LE1 6TP, UK), which has prospectively

collected well validated information for over 10 years. This study includes all children with seizures as a pragmatic definition of encephalopathy and reports population rates in the Trent Region of the United Kingdom varying from 1.3 to 1.4 per 1000 live births between 1999 and 2003. Neither study approaches the reported prevalence from Western Australia,² but the latter was also a deliberately inclusive study. All three studies use different definitions.

In trying to understand the prevalence and outcome of intrapartum hypoxia, this study shows the need for accurate and clear case definition and for the role of obstetric factors, routine collection of cord blood gas data, and neonatal imaging with magnetic resonance imaging in teasing out the cause. All neonatal services should collect this information. The best definition of encephalopathy remains the three categories described first by Sarnat and Sarnat³ with or without the presence of seizures. A consensus over definition of encephalopathy is perhaps required in situations where detailed neurological assessment has not been carried out and for epidemiological purposes, although

perhaps better would be to define a more useful perinatal dataset to allow better population data collection.

Cerebral palsy is perhaps the most important outcome in a study such as this. The prevalence of other disability such as visual impairment, deafness, and cognitive impairments is almost as important and would provide additional information on the level of disability, which is often severe after damaging intrapartum hypoxia. Pragmatic and accurate data collection is preferable to more detailed information without accuracy or universal coverage. We have standards to which our outcome studies for preterm children should aspire⁴ and definition of health status⁵ that has proved to be reliable in this group.⁶ It

may now be time for some consensus over case definition, follow up, and outcome definition for the encephalopathic newborn.

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