

## **Corticosteroids for bacterial meningitis? Still a matter of clinical judgment.**

John S Bradley MD

In the May 7, 2008 issue of JAMA, corticosteroids as adjuvant therapy was found not to affect mortality, time to death, or time to hospital discharge. Mongelluzzo et al mined the administrative database of the Pediatric Health Information System (PHIS), a tool managed by the Child Health Corporation of America for specific information relevant to outcomes from infants and children with bacterial meningitis (3).

The question of benefit derived from corticosteroids and mortality in children with meningitis is an important one. The PHIS database was created as an administrative tool, using discharge diagnosis codes (ICD-9) to compare participating pediatric healthcare organizations, and was not designed to answer clinical questions for a specific treatment. The data entered as diagnosis codes are not controlled to the degree required for a prospective clinical treatment trial, in which severity of illness scores such as PRISM are meticulously collected on critically ill children (4). While the use of discharge diagnoses for conditions present during the first day of hospitalization (eg, endotracheal intubation) as a marker for severity of disease provides greater statistical accuracy, and the use of propensity-adjusted Cox proportional hazards regression models may mitigate some “statistical imbalance” in the covariate analysis, the data entered into PHIS is done so by medical coders, and not by physicians. While data on the age and length of hospitalization will be accurate, data on the why children received corticosteroids (physician preference vs severity of illness) will not be known; the question of the critical timing of steroid therapy (and whether steroids were provided at a referring community hospital) will also not be known. In a large retrospective review of pneumococcal bacterial meningitis occurring in children hospitalized at 8 tertiary care pediatric centers across the United States, the great variability in management from center to center made conclusions regarding the impact of one single treatment (eg, corticosteroids) on outcome, virtually impossible (2).

As pointed out by the authors, the benefits of adjunctive steroid therapy are not well defined for pneumococcal meningitis for children living in the United States, as no adequate and well-controlled studies have been performed. Although these studies were considered following publication of data for *Haemophilus influenzae*, type B, in which hearing loss only was significantly decreased in those receiving corticosteroids, the imminent approval of the conjugate pneumococcal vaccine with the anticipated eradication of pneumococcal meningitis precluded this important prospective, randomized, blinded study from being carried out in the United States in populations and hospitals similar to those present in the PHIS database. As the authors themselves suggest, it is only this study that will answer the question.

The authors have performed statistical miracles on a flawed database, but this JAMA article should not be taken as definitive evidence that corticosteroids provide no benefit to children with pneumococcal meningitis. However, the benefit, if present, is not so striking as to mandate the use of steroids in all children with pneumococcal meningitis. For those who continue to believe that some benefit may be present in a subset of these children, and that these benefits are greater than the small theoretical risks inherent in steroid therapy, steroids should continue to be considered, concurrent with the first dose of antibiotics, as suggested by the American Academy of Pediatrics Committee on Infectious Diseases (1).

### References:

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