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EDITORIAL

The Changing Characteristics of Neonatal Sepsis in the Neonatal Intensive Care Unit: A Never-ending Challenge

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Despite recent advances in neonatal care, neonatal sepsis remains an important cause of illness and death among infants admitted to the neonatal intensive care unit (NICU).[1–5] The overall case-fatality rates from neonatal sepsis range from 2% to as high as 50%.[6] Antibiotics are increasingly used in newborn care to deal with this important problem. However, there is concern that the increased use of antibiotics might result in a change in the spectrum of organisms and/or their susceptibilities to antibiotics.[7–10] Over the years, several studies have shown changes in epidemiologic trends of neonatal sepsis.[4,11–14] Furthermore, temporal and geographic differences in the relative frequencies of various neonatal pathogens are well recognized.[11,15–17]

In order to make effective decisions regarding empiric antibiotic therapy, surveillance of ordinary causative microorganisms in each NICU is required. In this issue of the journal, Wu et al report on their surveillance study of neonatal sepsis in the NICU of a tertiary medical center in northern Taiwan.[18] They found that most neonates with early-onset sepsis were term infants, while very-low-birth-weight (VLBW) and preterm infants accounted for the majority of cases of late-onset sepsis. In early-onset sepsis, the leading pathogens responsible were group B streptococci (GBS) and *Escherichia coli*. GBS were associated with more meningitis but lower mortality than *E. coli*. The most common pathogens involved in late-onset sepsis were coagulase-negative staphylococci and *Candida*. The sepsis-related mortality rates were higher for early-onset sepsis (10%) than late-onset sepsis (7%). They also suggested that GBS screening and intrapartum antibiotic prophyl (IAP) guidelines should be popularized in Taiwan to prevent neonatal early-onset sepsis. Although, this report provides us with information on the epidemiologic trends in this NICU, several issues must be addressed before general implementation of GBS screening and IAP guidelines in Taiwan.

The first such issue concerns the study population. This report is based on surveillance of neonates admitted to a single NICU. It is not a population-based study, and whether or not its results can be applied to the general population in Taiwan is still unknown. A well-conducted population-based prospective study should answer this question.

The second issue is that this report reveals that most neonates with early-onset sepsis were term infants, while VLBW and preterm infants accounted for the majority of cases of late-onset sepsis. This is a very interesting finding and is quite different from those reported in a previous study. Benitz and associates performed a data analysis of risk factors for early-onset GBS sepsis from the 1970s to the 1990s to generate odds ratio estimates for several clinical factors. In their study, the neonatal risk factors predictive of early-onset GBS sepsis included prematurity (<37 weeks' gestation), and low birth weight (<2500 g), especially a birth weight <1000 g.[19] From a practical point of view, it is not useful to demonstrate that most neonates with early-onset sepsis were term infants, while VLBW and preterm infants accounted for the majority of cases of late-onset

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sepsis. Instead, the identification of risk factors such as prematurity and low birth weight are more helpful in clinical decision-making.

The third issue relates to the cost-effectiveness analysis of generalized GBS screening and the application of IAP guidelines recommended by the CDC. Strategies based on screening for GBS colonization using rectovaginal cultures at 36 weeks' gestation, or using a rapid test to screen for GBS colonization on presentation for delivery, combining intrapartum prophylaxis for selected mothers and postpartum prophylaxis for some of their infants, would require treatment of fewer patients and prevent more cases (78.4% or 80.1%, respectively) at lower costs.[20]

Finally, even after widespread implementation of GBS screening and IAP guidelines in United States, there is a coincident finding that Gram-negative enteric bacteria have become the leading cause of EOS in preterm infants.[14,21] Again, we need to be careful about the generalized implementation of GBS screening and IAP guidelines; more studies are needed to evaluate their benefits/costs in the neonatal population.

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