



Immunotherapy of Neonatal Infections

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The mortality and morbidity associated with neonatal sepsis remain high despite advances in antimicrobial chemotherapy and supportive care. Very-low-birth-weight infants are in particular at a greater risk to early- and late-onset sepsis. Early- and late-onset sepsis represent two distinct spectrums in terms of responsible microbes and potential pathogenesis. For example, group B *Streptococci* and *E. coli* are the representative gram-positive and gram-negative organisms responsible for early-onset sepsis. In contrast, gram-positive bacteria, particularly coagulase negative *Staphylococci* are predominant in causing late-onset neonatal sepsis. This review summarizes our current understanding about the epidemiology, prevention and therapy of neonatal sepsis. The recent introduction of selective maternal chemoprophylaxis has been shown to be efficient in reducing early-onset neonatal group B streptococcal sepsis, but resulted in increased early-onset sepsis caused by *E. coli* and other gram-negative bacteria. At present, there are no effective measures to reduce/prevent early-onset gram-negative bacillary sepsis. In contrast, as described above, most late-onset sepsis cases, particularly with coagulase negative *Staphylococci* have been shown to be associated with the placement of intravascular catheters and considerable progress has been made to reduce nosocomial bloodstream infections in very-low-birth-weight infants. These include issues related to quality assurance, catheter insertion site, type of catheter material, hand hygiene and maximal sterile barrier precautions. In addition, the feasibility of immunoprophylaxis and therapy is under investigation. Previous studies using human intravenous immunoglobulin (IVIG) preparations for the prevention and therapy for neonatal sepsis have yielded inconsistent results. Potential limitations include varying spectrum of antibacterial antibodies amongst different IVIG preparations and unknown protective antigens against certain bacteria. Recent studies have identified specific determinants of *Staphylococcus epidermidis* contributing to adherence to biomaterials, which are potential targets for immunoprophylaxis and therapy of intravascular catheter-related infections.