

Curbing Infection in the Neonatal Intensive Care Unit

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Infections occurring in Neonatal Intensive Care Unit (NICU) patients throughout Central and Eastern Europe continue to pose a challenge to health care professionals. Though some infections are related to poor prenatal care and some are early-onset, most are acquired in the hospital. In the NICU, inadequate diagnosis of infections in newborns--who are usually treated for complications of preterm labor, low birthweight or non-specific findings other than infection--and prolonged antibiotic treatment leading to drug-resistance have contributed to the problem.

Until recently, policies on diagnosing and treating infections in NICU patients at Kosice Faculty Hospital in Kosice, Slovakia were typical of many CEE hospitals. For example, if doctors suspected sepsis, they would put infants on a 14- or 21-day course of antibiotics, even if no specific signs of infection were found. In addition, babies sometimes were treated for surface infections or simply for prevalent infections among babies in the neonatal unit, regardless of blood culture results. A common problem in the NICU was infection with drug-resistant organisms without positive blood cultures due to a long duration of antibiotic treatment.

Over the last two years, we have begun to tackle the issue of NICU infection and antibiotic overuse with the help of our partners at Women and Infants Hospital of Providence, Rhode Island. As a result, we have implemented a series of changes in the unit's antibiotic policies:

- * For most patients, we now take blood cultures shortly after admission to the NICU (in some we may also do lumbar punctures).
- * We begin treatment with ampicillin and gentamicin.
- * If the blood culture is negative and there is no other reason to treat, we stop antibiotics on the second or third day.
- * If the patient deteriorates we take new blood cultures. Since the most common infectious agent is *Staphylococcus epidermidis*, we may start vancomycin, while continuously assessing other clinical problems.
- * If the blood culture is positive for a nosocomial pathogen, we treat the baby for five to seven days, depending on clinical condition.
- * If the blood culture is negative, we stop the antibiotics as soon as possible.
- * Handwashing is the principal method we employ as a barrier to cross-contamination and nosocomial spread of infection.
- * Surface, stool, and upper airway cultures are not routinely done and are not automatically considered evidence of infection. They are evaluated and treated according to the clinical context.

These policies have already led to significant savings in NICU antibiotic costs, which dropped from \$12,873 in 1995 to \$ 5531 in 1996. At the same time, the number of admissions rose from 110 to 155. As the accompanying chart indicates, infant mortality decreased in all weight categories despite fewer dollars spent on antibiotics. Additionally, we are developing better information about nosocomial infections--most often on *Staphylococcus epidermidis*--and, by using fewer antibiotics, we may have decreased the colonization of drug-resistant organisms in babies.

The collaboration with our partners in Rhode Island has also led to increased use of exogenous surfactant (a special drug injected into the lungs of newborns with pulmonary disease), placement of more arterial and venous catheters, and changes in management principles for conventional ventilation. All of these modifications were implemented using existing equipment, no additional staff, and at considerable cost savings. In addition, we are reviewing therapeutic protocols of drugs not clearly proven effective by clinical trials.

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