Letter to the Editor

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Combatting Burkholderia Cepacia in Neonatal Intensive Care

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Introduction

We are writing to bring your attention to a serious issue concerning the emerging threat of *Burkholderia cepacia* infection in the Neonatal Intensive Care Unit (NICU) and the subsequent challenges in its management. *B. cepacia*, a risky pathogen for hospital-acquired infections, poses significant health risks to patients due to its high fatality and mortality rates.[1] Its emergence as a major pathogen in hospital settings is concerning, particularly in light of its strong intrinsic drug-resistant profile and the emergence of acquired drug resistance patterns.[2] While it was initially thought to be linked to contamination from pharmaceutical products like sanitizers and disinfectants, it is now emerging as a deadly pathogen among ICU patients.[3]

Within 13-day duration in November 2023, three infants were found to have *B. cepacia* bacteraemia in the neonatal intensive care unit. *B. cepacia* was isolated from blood culture specimens, and the similar pathogen isolation and antimicrobial susceptibility pattern from the same location within a very short time confirmed the outbreak, prompting additional investigation. Active investigation of the outbreak was initiated, and bacterial surveillance was carried out to discover the source and eliminate the outbreak.

Among the three infants, the presence of *B. cepacia* isolate was revealed in the aerobic blood culture analysis of an infant after incubating it for 12-24 hours. The antimicrobial susceptibility pattern showed sensitivity to ciprofloxacin, levofloxacin, meropenem, and cotrimoxazole, but resistance to ceftazidime. The patient successfully recovered from sepsis with levofloxacin and cotrimoxazole, treatment. However, shortly after this, another case presented with identical symptoms, confirming the presence of *B. cepacia* after incubating for 8 hours in the BactAlert automatic blood culture system. This time, the pathogen revealed signs of multidrug resistance, being resistant to sulphonamides, third generation cephalosporins, and second and third generations of the fluoroquinolones. Although meropenem treatment was initiated, the infection claimed her life in two days.

Beyond patient care, investigations were extended to search for the source of *B. cepacia* in the NICU. Approximately 43 environmental samples were taken, including different antiseptics like iodopovidone, hydrogen peroxide, chlorhexidine, and alcohol-gel. Drugs such as tobramycin and fentanyl citrate, and morphine drops were tested, along with multiple other commonly used items like ultrasound gels, soap, etc. According to bacterial surveillance, no culture swab showed the growth of *B. cepacia*. However, different equipment and surfaces, such as cardiac monitor surfaces, medicine trolleys, incubators, nursery flooring, nursing counters, walls, and staff nasal swabs, were shown to harbour other gram-positive and gram-negative organisms.

To identify the source of *B. cepacia*, we focused on different water sources inside the NICU, such as tap water, oxygen flow meter water, and water from equipment that warms baby milk bottles, as well as janitorial staff mopping. According to the results of bacterial cultures, the *B. cepacia* culprit was found to be growing on the equipment used to warm milk bottles and in the oxygen flow meter water.

To minimize the potential for further spread, we implemented comprehensive measures, including thorough cleaning with detergent, disinfection, and fumigation with Alpha Guard disinfectant. Additionally, we replaced the distilled water supply for the oxygen flow meter with adequately filtered tap water (RO Plant

installed) and established a daily rotation for changing the oxygen flow meter glass water. The equipment that warmed baby milk bottles was also changed, and staff members were reminded to follow strict cleaning procedures to guarantee that the equipment had no leftover water after each use.

This encounter emphasizes the importance of infection prevention practices in healthcare settings, especially in intensive care units. To mitigate the risk of an outbreak and protect patient safety, it is essential to initiate approaches that address the potential source of contamination. In the healthcare environment, the transmission of pathogens can be prevented by identifying and addressing the root cause of infection, thereby increasing, and protecting patient outcomes.

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