FOllow-up point prevalence survey of antimicrobial use in the cardiac and paediatric critical care unit

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Introduction: Blinova et al. (2013) conducted a point prevalence survey in 2008 within the Critical Care Unit (CCU) at SickKids® and found a high rate of antimicrobial use (70-79%), with up to 62% of antimicrobials deemed as inappropriate. Since 2008, initiatives implemented to promote appropriate use of antimicrobials and to reduce infections include the Antimicrobial Stewardship Program, various educational initiatives, and a mouth care protocol to prevent ventilator-associated pneumonias. Current literature supports ongoing surveillance of antimicrobial use to evaluate the effectiveness of such initiatives and to monitor trends over time.

Objectives: Primary: To determine the prevalence of infections and antimicrobial use among paediatric patients admitted to the Critical Care Unit (CCU), and to assess the appropriateness of antimicrobial prescribing. Secondary: To describe differences in the primary objectives between the cardiac critical care unit (CCCU) and paediatric intensive care unit (PICU), fall and winter seasons, and compare results with a previous point prevalence study.

Methods: All patients in the CCU during one week in October (Period A) and February (Period B) receiving systemic antimicrobials were followed until completion of antimicrobial therapy or discharge. Data about antimicrobials prescribed, indications, infection types, and recommendations by antimicrobial stewardship and infectious disease teams were collected. Five blinded clinician assessors rated appropriateness of antimicrobials prescribed according to 9 pre-defined criteria. Disagreements on overall appropriateness were resolved during a consensus meeting.

Results: Fifty-nine of 71 patients (83%) in Period A and 52 of 68 patients (77%) in Period B received antimicrobials. A definite infection was diagnosed in 12% of CCCU patients, compared to 39% of PICU patients. A presumed infection was diagnosed in 17% of CCCU patients and 21% of PICU patients. Presumed sepsis, bloodstream infections and pneumonia were the most prevalent infections. Empiric therapy was the most common indication. The most frequently prescribed antimicrobials were cefazolin, vancomycin, ceftriaxone, piperacillin-tazobactam, and gentamicin. Inappropriate antimicrobial use ranged from 15.4 to 52.5%, varying by assessor and survey period. The most common reasons for inappropriate use were inappropriate duration, unnecessary use, and overly broad spectrum. Compared to the previous study, there were variations in infection types and antimicrobial use, but overall inappropriateness rates were similar.
Conclusion: Prevalence of antimicrobial use in CCU patients remains high with a significant proportion still considered inappropriate. Further research to evaluate and resolve factors associated with inappropriate antimicrobial use in critically ill children is needed.