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Impact of needleless connector change frequency on central line-associated bloodstream infection rate

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Abstract

Background: Bloodstream infection is the most common pediatric health care-associated infection and is strongly associated with catheter use. These infections greatly increase the cost of hospital stay.

Methods: To assess the association between needleless connector (NC) change frequency and central line-associated bloodstream infection (CLABSI) rate, we modeled monthly pediatric stem cell transplant (SCT) CLABSI rate in 3 periods: baseline period during which NC were changed every 96 hours regardless of infusate (period 1); trial period in which NC were changed every 24 hours with blood or lipid infusions (period 2); and a return to NC change every 96 hours regardless of infusate (period 3). Data on potential confounders were collected retrospectively. Autocorrelated segmented regression models were used to compare SCT CLABSI rates in each period, adjusting for potential confounders. CLABSI rates were also assessed for a nonequivalent control group (oncology unit) in which NC were changed every 24 hours with blood or lipid use in periods 2 and 3.

Results: SCT CLABSI rates were 0.41, 3.56, and 0.03 per 1,000 central line-days in periods 1, 2, and 3, respectively. In multivariable analysis, the CLABSI rate was significantly higher in period 2 compared with both period 1 ($P = .01$) and period 3 ($P = .003$). In contrast, CLABSI rates on the oncology unit were not significantly different among periods.

Conclusion: In pediatric SCT patients, changing needleless connectors every 24 hours when blood or lipids are infused is associated with increased CLABSI rates. National recommendations regarding NC change frequency should be clarified.

Keywords: Catheter-related infections; Pediatrics.

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