Reducing Central Line-Associated Blood Stream Infections in the Neonatal Intensive Care Unit

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Background

A central line-associated blood stream infection (CLABSI) is an event that can be detrimental to any hospitalized patient, but especially to a fragile neonate. These patients often require central lines for long term nutrition or IV therapy, but their use is not without risks. A CLABSI can cause significant morbidity and mortality in the neonatal population. For that reason, CLABSI prevention should be a priority in every NICU. There are many prevention strategies discussed in the literature including standardization using bundles and checklists, staff education, hub scrubs, and insertion and maintenance teams. The literature does not identify one specific strategy as best practice to prevent CLABSIs, suggesting a combination of strategies, as well as diligent attention to line care and maintenance to prevent these events.

Purpose

This project addressed current CLABSI rates of neonatal patients in six NICUs across the country from 2009 through 2013, along with the prevention strategies, practice changes, and infection control measures that were used. The main objective of this study was to add to the current knowledge base about the prevention strategies and best practice guidelines for CLABSI reduction in the neonatal population

Methods

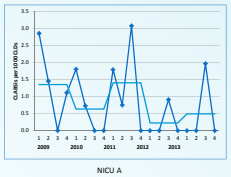
- Non-experimental, retrospective, descriptive study
- Data collected from each facility included CLABSI rates reported to the Vermont Oxford Network (VON) and infection prevention processes in place during the study timeframe.
- Timeframe was from 2009-2013
- Setting: 3 level III NICUs identified as NICU-A, NICU-B, and NICU-C and three level II NICUs identified as NICU-D, NICU-E, and NICU-F. Of note, NICUs A, B, E and F are part of the same organization and had the same infections prevention strategies and policies
- Sample included all NICU patients who had a central line infection from an umbilical arterial catheter (UAC), an umbilical venous catheter (UVC), a PICC, or a Broviac catheter.
- Sample obtained through convenience sampling.
- Monthly CLABSI rates collected using standard formula:
  (# CLABSIs/ # catheter days) x1000

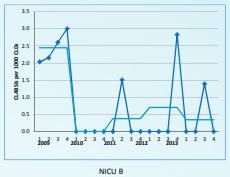
Results

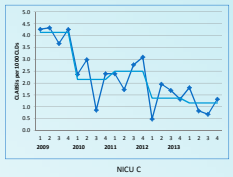
We did not find that specific interventions were more effective at reducing CLABSI rates. The study did show evidence that implementing bundles of evidence-based infection prevention practices and education does reduce CLABSIs. This was seen in the drop in CLABSI rates in both the level II and level III NICUs following multiple changes in their infection prevention strategies.

Additionally, the level II NICUs overall had a lower mean CLABSI rate, which could be because of a lower acuity of patients in the level II units.

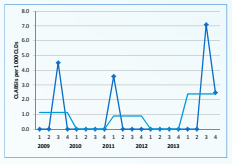
Level III NICUs

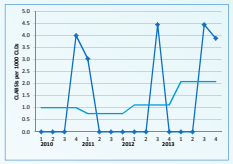


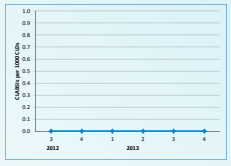




Level II NICUs







Conclusions

The findings of our study demonstrated that there may be a relationship between multifaceted intervention bundles and reduced CLABSIs. Not only were decreased infection rates demonstrated after implementation of interventions, but the NICUs were able to show sustained results over time, providing further evidence that CLABSIs are preventable and nursing care and diligent attention to line practices can be a driving force in their prevention.