Prevention of Central Venous Catheter Infections Using Chlorhexidine “Scrub the Hub” Campaign in Pediatric Transplant Patients

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INTRODUCTION

Sepsis is the leading cause of morbidity and mortality in post-transplant recipients. In addition to an immunosuppressed state and other risk factors, the presence of central venous catheters (CVC’s) significantly increases the risk of bacteremia. CVC’s are essential for providing alimentation and for vascular access. Infection control by frequent surveillance and prevention techniques can positively influence patient outcomes and minimize the financial impact on a healthcare system.

OVERVIEW

PEDIATRIC TRANSPLANT SURGICAL UNIT (PTSU)

9-bed Multi organ transplant unit.
Age: Newborn to 21 years of age.
Patient Population:
- Heart Transplant
- Kidney Transplant
- Kidney / Pancreas Transplant
- Liver Transplant
- Intestinal Transplant
- Multi-visceral Transplant

PROBLEM

- 2007: Central vascular catheter bloodstream infection (CVC-BSI) rates were 22 infections per 1000 line days.
- No published benchmark specific for a pediatric transplant population.
- 70% of PTSU patients had a CVC.

Surveillance Definition and Criteria:

Rate Calculation:
- Number of CVC Bloodstream Infections (CVC-BSI) divided by the number of central line days multiplied by 1000 (CVC-BSI / Central line days X 1000)
- Positive blood culture results are analyzed.
- Community acquired and Healthcare associated cases are differentiated

METHODS

PROPOSED STUDY

- Nonrandomized, prospective study including all patients admitted to PTSU with a CVC regardless of admitting diagnosis.
- 2008 Internal benchmark established
- 11 infections per 1000 line days.
- A campaign, “Scrub the Hub”, was launched in August of 2008.
- Establishment of a steering committee to develop protocols. Team members included:
  - Unit Practice Council (UPC)
  - Nurse Educator
  - Nurse Manager
  - Transplant physicians
  - Peripherally inserted central catheter (PICC) Coordinator
- August 2008 “Scrub the Hub” technique and Two-person assisted dressing change were instituted.

SCRUB THE HUB

- When a CVC is accessed, the injection port in cleaned using a friction scrub for 15 seconds with a 2% chlorhexidine solution.

TWO-PERSON TECHNIQUE

- Utilized for any patient who is not capable of remaining still for a dressing change
- 1st person holds baby to help maintain sterility
- 2nd person performs procedure
- Dressing change was performed by champions every Wednesday

RESULTS

- Prior to implementation of the “Scrub the Hub” campaign in August 2008:
  - Quarterly CVC BSI rates ranged from 6.3 to 22 BSI/1000 catheter days with a mean of 14.5.
- Post implementation of “Scrub the Hub” campaign:
  - CVC BSI rate plummeted to 3.6 BSI/1000 catheter days with a mean of 3.5.

FINANCIAL IMPACT

- The 2009 NHSN reported that the 50% percentile is 2.5 BSI per 1000 days.
- A pooled mean of 3 episodes per 1,000 CVC line days.
- Attributable cost=$34-$56,000 per infection
- Attributable mortality 12-25% per infection

NOTE: Attributable costs not specific to Pediatric Transplant Unit. PTSU is not an ICU.

CONCLUSION

- The “Scrub the Hub” campaign is a simple yet successful technique that can be implemented to prevent CVC infections.
- Although chlorhexidine swabs are more expensive than alcohol swabs, the cost of one line infection would likely cover the difference for several months’ worth of chlorhexidine swabs.

LESIONS LEARNED

- Best Practice supports the time and friction cleaning and the use of CHG to decrease CVC BSI.
- Multidisciplinary sharing throughout HCH and Jackson Health System decreases CVC-BSI events and improves quality of care provided to patients.

REFERENCES:

CDC Guidelines for the Prevention of Intravascular Catheter-Related Infections, MMWR, August 9, 2005/51(RR 10); 1-26 Cost-Effective Infection Success Story: A Case Presentation, Retrieved from http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5110a1.htm
