Use of Tego™ Connectors to Prevent Hemodialysis Catheter Infections in Children

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BACKGROUND

- 78.5% of pediatric patients on HD use central venous catheters (CVC) (NAPRTCS, 2006)
- Common complications, bacteremia, thrombosis, and catheter malfunction, associated with CVC increase morbidity, mortality, and shorten catheter survival.
- In 2005 our center experienced a higher than desired infection rate in patients with CVCs.
- We undertook a quality improvement (QI) project using Tego™ connectors hypothesizing that use of Tego™ connectors in a chronic outpatient hemodialysis population would reduce the incidence of catheter related bacteremia.

MATERIALS AND METHODS

- October 1, 2005 began the use of Tego™ connectors
- Connectors were replaced on Monday or Tuesday of each week (patients receiving 3+ treatments/wk were replaced on Monday and Friday).
- Changes were done with sterile set up using aseptic technique.
- Masks were worn by patients and staff for connector changes since the catheter lumen was exposed to air.
- Connectors were cleaned between treatments with alcohol and allowed to dry.
- Lines were locked with heparin according to protocol and labeled “High Dose Heparin Do Not Flush” at completion of treatment.
- Data were collected on number of infections, line revisions and total patient-months at risk by quarter.
- Historical control data on infections occurring with male/female port caps were available from January 2001 through September 2005.
- Historical control data on line revisions were available from January 2002 through September 2005.
- A negative binomial model was used to estimate the incidence rate ratio and a corresponding 95% confidence interval for comparison of event rates before and after the switch to Tego™ connectors.
- The model was formulated with number of infections or number of line revisions as the dependent variable, an indicator of pre/post Tego™ switch as the independent variable and an exposure variable to adjust for patient-months at risk in each calendar quarter.
- IRB approval was obtained for this study from Children’s Hospital and Regional Medical Center Internal Review Board (IRB).

RESULTS

- The immediate pre-Tego™ sample included 21 patients with 93 months of dialysis therapy.
- The post-Tego™ sample included 29 patients with 207 months of dialysis therapy.
- Patients ranged in age from 3 to 20 years with the average age 12-14 years.
- Number of infections per 1,000 patient-days were as follows: 7.8 infections per 1000 patient-days during the pre-TEGO™ period vs. 3.62 infections per 1000 patient-days post TEGO™.
- The BSI Incidence Rate Ratio was 0.47 (95% CI: 0.23 – 0.96), indicating the BSI rate with TEGO™ was less than half the BSI rate in the preceding 5 quarters. This is a statistically significantly reduction (p<0.05).

CONCLUSIONS

- Although technical improvements in vascular access surgery may allow AV fistulas or grafts in more patients, central venous catheters will remain a necessary mode of vascular access in many children, especially the very young.
- Further research needs to be done to devise methods to prevent infections and malfunction of these catheters (Neu, Ho, McDonald, & Warady, 2002).
- Use of Tego™ connectors has provided one method for our unit. We anticipate continued success with the use of these connectors.

BIBLIOGRAPHY