Humber River Health

A MULTIDISCIPLINARY APPROACH TO CATHETER-RELATED BACTEREMIA CAUSED BY STENO IN HEMODIALYSIS PATIENTS

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DESCRIPTION

In Summer 2023, three cases of catheter-related bacteremia (CRB) were found in hemodialysis patients from blood cultures taken only a few days apart, highlighting a potential problem. Other cases arose overtime, with some severe enough to require emergency department care. The common causal agent was Stenotrophomonas Maltophilia (Steno), an antibiotic-resistant environmental bacterium, making treatment more complex and prevention of transmission a priority. This prompted a review, leading to several actions aimed at mitigating further patient risk.

OBJECTIVE

To reduce occurrences of CRB caused by Steno in Humber River Health's (HRH) hemodialysis patients.

ACTIONS TAKEN

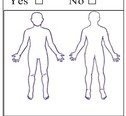
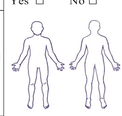
The following interventions were implemented:

- Multidisciplinary CRB working group was established to review cases and recommend interventions, involving Infection Prevention and Control, Vascular Access, Pharmacy, Data Analytics, and the Nephrology Care group
- Standardized case reviews, using Bacteremia Case Review Forms, supported in identifying case presentation trends and root cause analysis
- Environmental scan of Chlorhexidine/Alcohol Aliquoting practices of local renal programs
- Genotyping of cases to identify potential patient transmissions
- Drain cultures performed to determine whether dialysis drains were the source, which were negative
- Standardized drain care through Dialysis Assistant competency review
- Environmental Services conducted monthly rounding to evaluate department cleaning practices
- Practices related to central venous catheter access and care were updated; changes were solidified through integration into annual staff skills days and unit policies

Nosocomial Bacteremia Case Review

Patient Initials:_____ **Age**_____ **Sex**_____ **Admission**_____ **Admitting** _____

Diagnosis _____ **Date Reviewed:** _____ **Reviewed by:** _____

PICC Line Yes ☐ No ☐ IJ Yes ☐ No ☐ EJ Yes ☐ No ☐ Subclavian Yes ☐ No ☐ Femoral Yes ☐ No ☐ Antecubital Yes ☐ No ☐	**Other Risk Factors** Diabetes Yes ☐ No ☐ MRSA Colonization Yes ☐ No ☐ VRE Colonization Yes ☐ No ☐ Other Risk Factors Yes ☐ No ☐ Specify _____	Decubitus Yes ☐ No ☐  Location _____ specify	Drains: Yes ☐ No ☐  Location _____ specify
Date Line Inserted: Physician Date Line Removed: Total line days:			
Insertion Location ICU ☐ Inpatient unit ☐ ER ☐ OR ☐ ICU ☐ ER ☐ Rad ☐ Other ☐_____ specify	Date temp > 38 _____ Date WBC 4>WBC>12 _____	Date of the positive blood cultures: Set #1 date_____ site_____ Set #2 date_____ site_____ Set #3 date_____ site_____ Organism Isolated:	
Other Positive Cultures Urine: Sputum: Wound Other:	Was Line used for drawing labs Yes ☐ No ☐	Date drawn:_____ Date Unit notified_____ Date Physician notified_____ Antibiotic_____ Started_____	

Additional comments:

Recommendations/Opportunities for improvement from case review:

Figure 1. Bacteremia Prevention Case Review Form

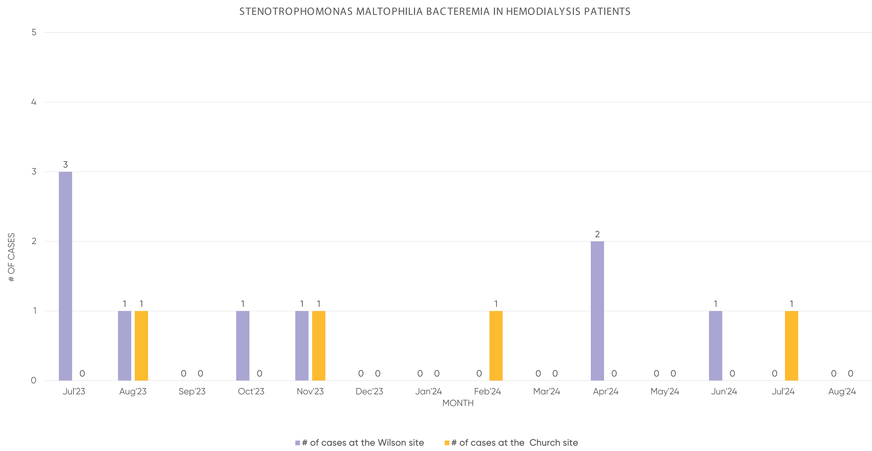


Figure 2. Cases of Stenotrophomonas Maltophilia bacteremia in Hemodialysis patients.

SUMMARY OF RESULTS

The clustered appearance of CRB cases caused by Steno led to the formation of a multidisciplinary team to investigate the root cause of transmission and action interventions. Multifaceted mitigation strategies successfully decreased the number of Steno-related bacteremia between zero or one new case per month for most months into August 2024. This approach correlated with reduced Steno cases within HRH's hemodialysis patient population.

LESSONS LEARNED

Multifaceted, multidisciplinary approach was required to combat CRB caused by Steno, as it is a complicated issue with several potential causal mechanisms.