LineLight: Epidemiology and Management of Tunnelled Central Venous Catheter-related Infections in a Haemodialysis Unit at a Tertiary Hospital: A Three-year Observational Study.

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Background and aim

- Tunnelled Central Venous Catheter (tCVC) related infections and bacteraemia are significant nosocomial infections that contribute to patient morbidity, mortality, prolonged hospital stay and heightened healthcare-related costs.
- Understanding the nature of these infections, including causative pathogens and management strategies, is crucial for optimising patient care.
- This observational study aims to provide a detailed analysis of tCVC infections.

Methods

- A retrospective review was performed including all patients undergoing intermittent haemodialysis using tCVCs in a tertiary hospital in Dublin from January 2022 – March 2024.
- Data was collected from a local database in the haemodialysis department, clinical documentation, electronic patient records and the hospital's radiology database.
- tCVC Infection characteristics' (nature, severity and complications of infection, pathogen distribution), and management approaches were analysed..

Results

Catheter-related interventions performed

During the 26-month study period, a total of 113 radiological procedures were performed manipulating tCVCs used for haemodialysis.

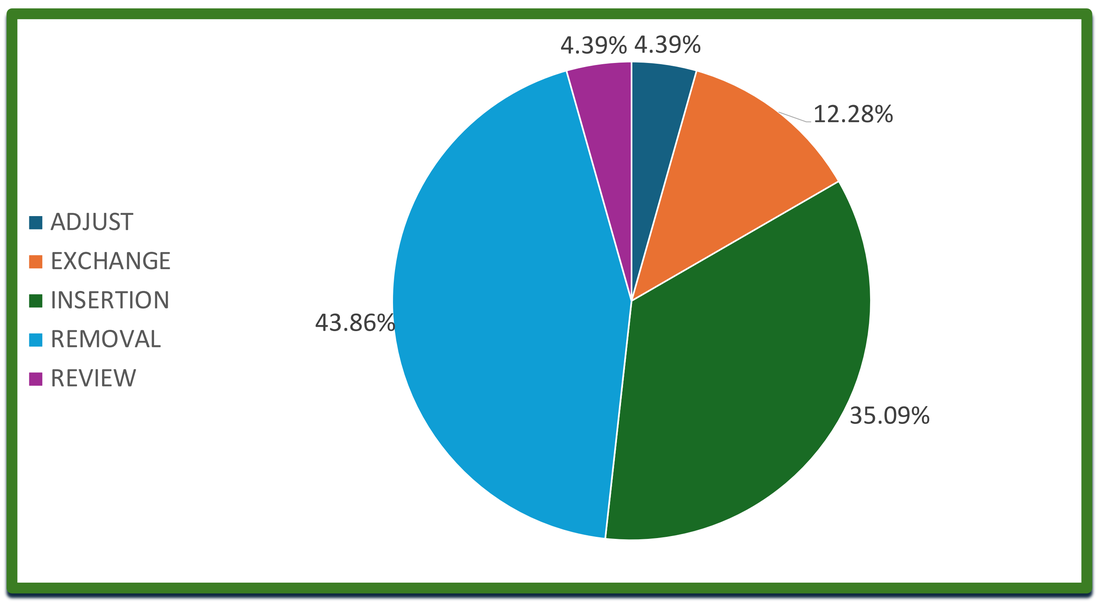

Figure 1. Dialysis catheter procedures performed in MMUH on haemodialysis patients between 01/01/2022 – 01/03/2024

Classification of catheter-related infection

A total of 34 catheter-related infections occurred in 20 patients using tCVC for haemodialysis over 26 months.

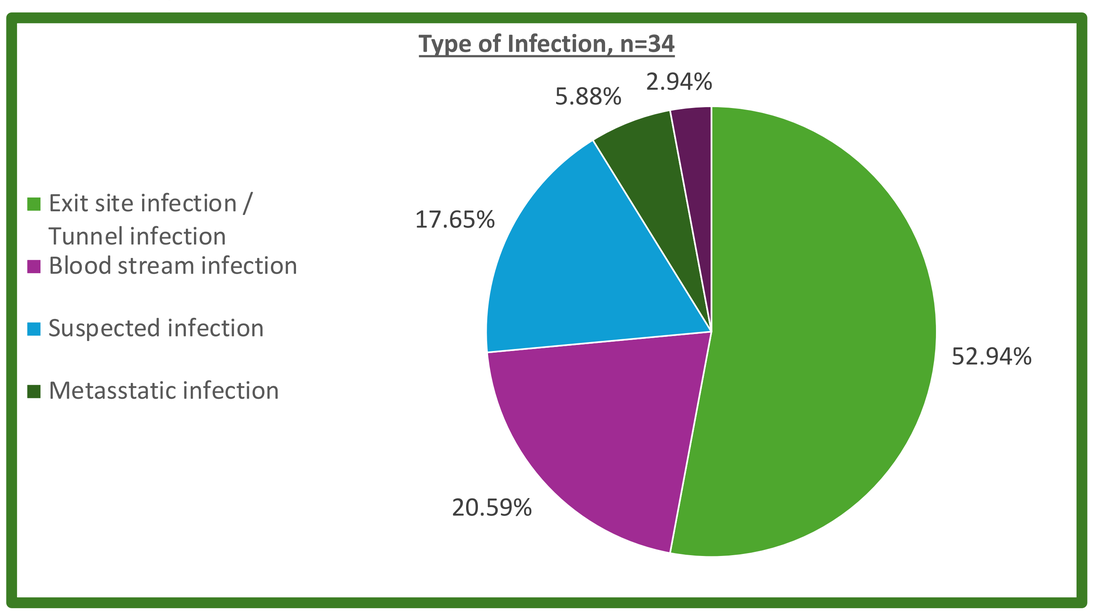

Figure 2. Classification of infection involving haemodialysis catheter (KDOQI guidelines)

Methicillin-sensitive S aureus (20.59%, n=7) and S epidermis (20.59%, n=7) were the most commonly isolated pathogens on swab and blood cultures.

Management of tCVC infections

- In 58.82%(n=20) of infections (majority exit site/tunnel infections), the tCVC remained in situ and the infection was treated with antibiotics.
- Line removal/exchange occurred in:
  - 27.77%(n=5) of exit site/tunnel infections
  - 71.42% (n=5) of bloodstream infections
  - 100%(n=2) of suspected infections
  - 100%(n=2) of metastatic infections

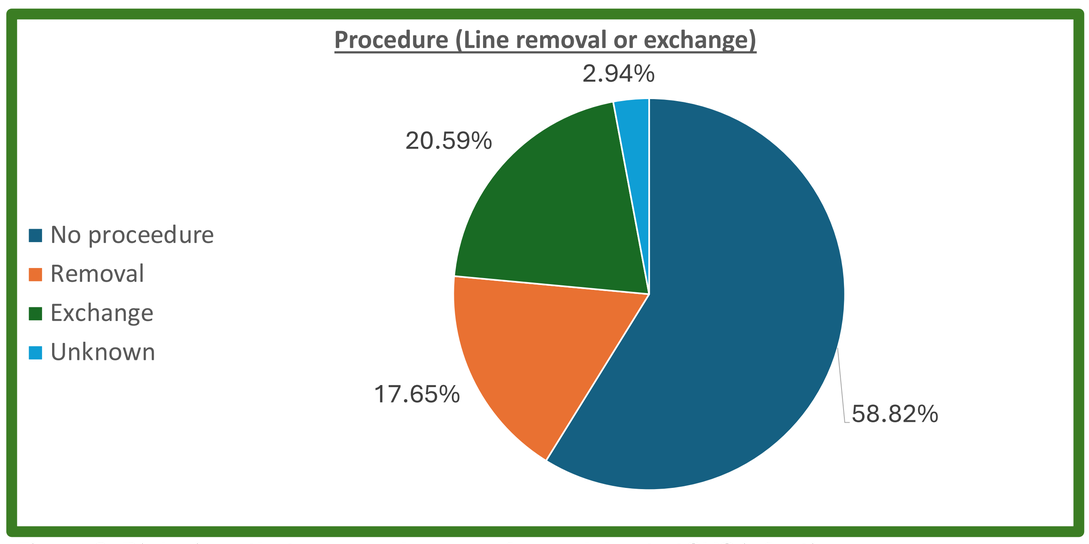

Figure 3. Dialysis catheter procedures performed due to tCVC infection

Ten infections resulted in inpatient admission. Average LOS was 22 days.

Organisms isolated from tCVC cultures during infection

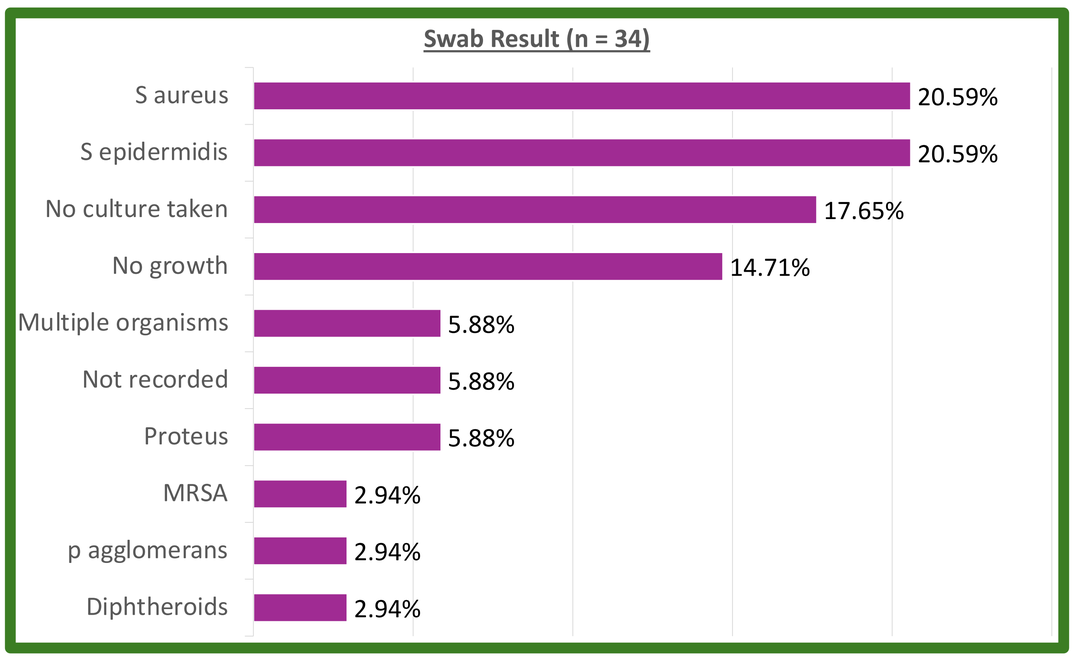

Figure 4. Pathogens isolated from tCVC cultures

Conclusion

- This study contributes data on the incidence, nature and management of tCVC-related infections to the existing literature. These results are valuable in informing local antibiotic guidelines.
- The results emphasise that efforts to minimize the protracted use of tCVC for haemodialysis access are warranted due to the observed infection rates and associated interventions, hospitalisations and inpatient length of stay. Continuing to promote arteriovenous fistulas (AVF) as optimal vascular access for haemodialysis could help mitigate these complications and improve patient outcomes.
- A limitation of this study was that it was not possible to differentiate between exit site infections and tunnel infections. Hence, it was not possible to determine whether an appropriate permcath intervention was performed. A prospective method of collecting this data has subsequently been developed.