



Complications of Central Lines in Non-ICU Neonates

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Introduction:

- The use of central venous catheters (CVCs): a routine but invasive practice in neonatal care, particularly in premature and low birth weight infants.
- Despite their clinical benefits, CVCs are associated with significant risks, especially in resource-limited settings.

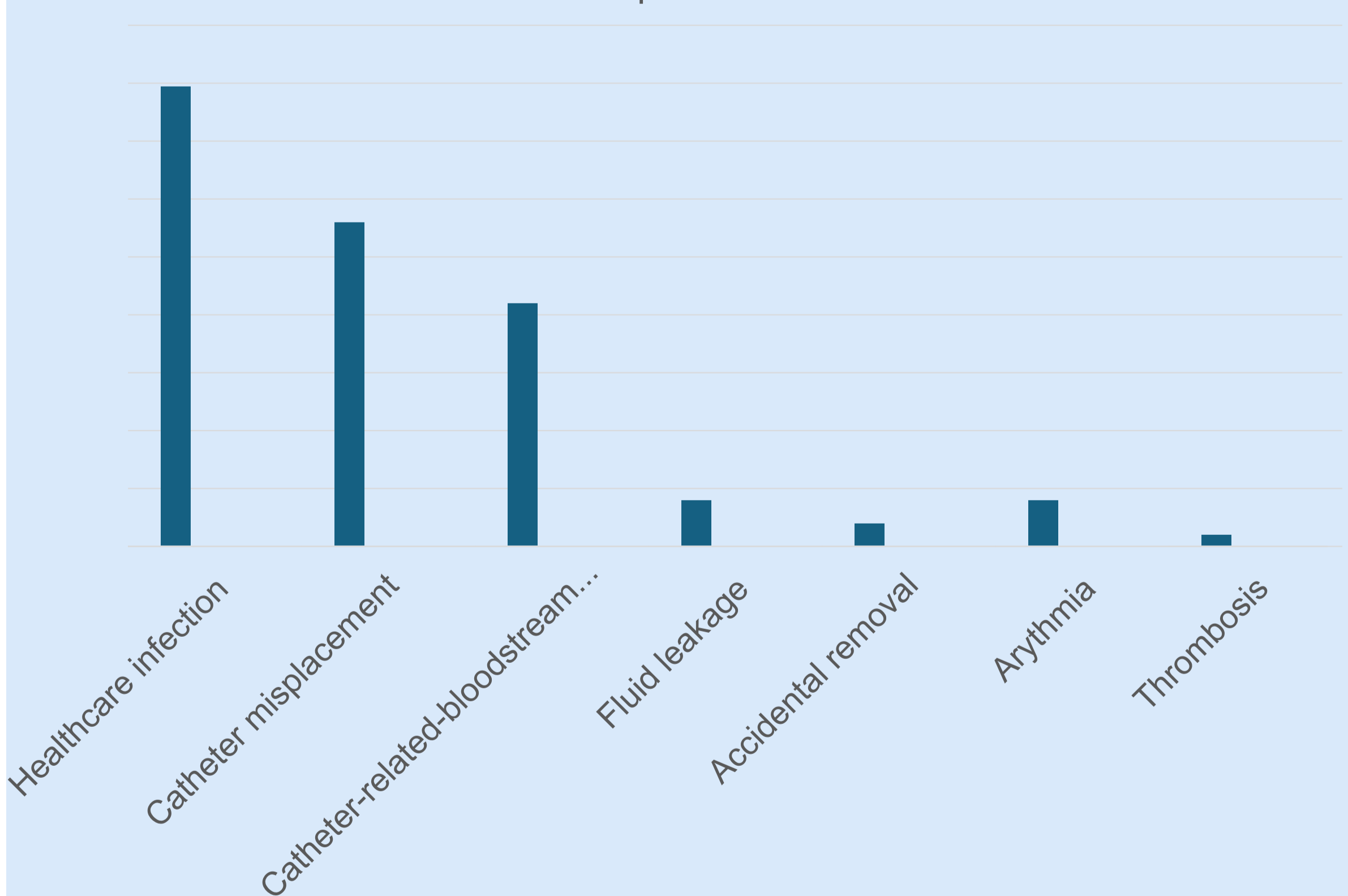
Materials and methods:

- Retrospective descriptive study
- **A 3-year period (January 2022–January 2025)** in the Pediatrics Department of Hospital Ben Arous, **a level II center without neonatal intensive care facilities**. The aim was to evaluate complications related to CVC use and identify associated risk factors.

Results:

- 61 neonates received a CVC.
- **The mean gestational age:** 32 weeks + 3 days
- **the mean birth weight:** 1835 grams.
- **Umbilical catheterization** alone was used in 78% of cases.
- **Complications:**
- No complications occurred in **34%** of patients
- **The most frequent complication:**
Healthcare-associated infection (39.7%)
followed by: Catheter misplacement (**28%**)
Catheter-related bloodstream infection (**21%**).
- **Less frequent complications :**
Fluid leakage (**4%**)
Accidental removal (**2%**)
Arrhythmia (**4%**)
Thrombosis (**1%**)

Complications



- **Among neonates with complications:**

weight under 2500g **85%**

32 weeks + 6 days of gestation **65%**

- **Prolonged catheter duration:** significantly associated with nosocomial infection ($p = 0.02$).

Discussion:

- Central venous catheters (CVCs) remain indispensable in neonatal care, especially for preterm and low birth weight infants requiring parenteral nutrition, medications, or hemodynamic monitoring. However, their use carries significant risks, as highlighted by our study, where 65.6% of neonates experienced at least one complication. This rate is notably higher than the 30% reported in previous literature, likely reflecting the resource limitations of our level II unit, which lacks dedicated neonatal intensive care facilities
- **Infectious complications, including catheter-related bloodstream infections (CRBSIs), were the most common in our cohort (21.9%),** substantially exceeding the ~4% typically reported in tertiary NICUs. This disparity may stem from challenges in maintaining strict aseptic technique, limited nurse-to-patient ratios, and the absence of continuous monitoring infrastructure,
- Our data confirm that **low birth weight (<2500 g) and prematurity (<33 weeks) are significant risk factors,** consistent with prior studies identifying immaturity of the immune system and fragile skin integrity as key contributors to infection susceptibility,
- **Mechanical complications, such as catheter misplacement (28%), accidental removal (2%), and thrombosis (1%),** underscore the technical challenges associated with umbilical and peripheral access in neonates. These complications highlight the need for careful insertion techniques, appropriate catheter selection, and routine radiographic verification when available,
- **Notably, prolonged catheter duration was significantly associated with nosocomial infections ($p = 0.02$),** reinforcing current recommendations to minimize catheter dwell time whenever clinically feasible
- Overall, our findings emphasize that CVCs in resource-limited neonatal units carry higher complication rates than in well-resourced NICUs. Implementing rigorous infection control protocols, staff training, and judicious catheter use can substantially reduce morbidity. Future multicenter studies could further delineate context-specific risk factors and evaluate the impact of preventive bundles on neonatal outcomes.

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