Targeting Zero Catheter - Related Bloodstream Infections in Neurointensive Care Unit: a prospective cohort study

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In our Institution we have recently built a new neurointensive care unit. Since the opening we have adopted and implemented a new three-component 'bundle' for insertion and management of centrally inserted central catheters (CICCs) aimed at zero catheter-related bloodstream infections (CRBSIs). Objectives of this prospective cohort study were to evaluate effectiveness, safety, feasibility and applicability of this newly conceived evidence-based ‘bundle’ of recommendations. Our 'bundle' has 3 components: insertion, management and education. Insertion and management recommendations include: skin antisepsis with 2% chlorhexidine; maximal barrier precautions; ultrasound guided venipuncture; ‘*Zone Insertion Method*’ (Central ZIM) for exit site location planning; systematic adoption of second generation antimicrobial coated CICCs; glue on the exit site; sutureless securement; use of transparent dressing; chlorhexidine sponge dressing on the 7th day; neutral displacement needle free connectors; port protectors; timely removal of no longer necessary catheters. All CICCs were inserted by appropriately trained physicians proficient in a standardized simulation training program. A clinical audit with all physicians and nurses is performed each six months. We have collected 669 days of CICCs. We had no episodes of CRBSI nor episodes of CICC-related thrombosis. We registered just one case of exit-site skin infection resolved after catheter removal. Our data suggest that a bundle aimed at zeroing CRBSIs in critically ill patients ought to incorporate three practices: (1) ultrasound guidance, which minimizes contamination, by reducing the number of attempts and possible break-down of aseptic technique; (2) adoption of the ‘*Central ZIM*’ protocol so to obtain exit site in an area with reduced bacterial colonization; (3) simulation-based education of the staff.