
Abstract:

BACKGROUND: Growing use of peripherally inserted central catheters (or, “PICCs”), has led to recognition of the risk of PICC-associated bloodstream infection. We sought to identify rates, patterns, and patient-, provider- and device-characteristics associated with this adverse outcome

METHODS: A retrospective cohort of consecutive adults who underwent PICC placement between June 2009 to July 2012 was assembled. Using multivariable logistic and Cox-proportional hazards regression models, covariates specified a priori were analyzed for their association with PICC-associated bloodstream infection. Odds ratios (OR) and hazard ratios (HR) with corresponding 95% confidence intervals (CI) were used to express the association between each predictor and the outcome of interest.

RESULTS: During the study period, 966 PICCs were inserted in 747 unique patients for a total of 26,887 catheter days. Indications for PICC insertion included: long-term antibiotic administration (52%, n=503), venous access (21%, n=201), total parenteral nutrition (16%, n=155) and chemotherapy (11%, n=107). On bivariate analysis, intensive care unit (ICU) status (OR 3.23 [1.84-5.65]), mechanical ventilation (OR 4.39 [2.46-7.82]), length of stay (hospital, OR 1.04 [1.02-1.06] and ICU, OR 1.03 [1.02-1.04]), POWER PICCs (OR 2.58 [1.41-4.73]), and devices placed by interventional radiology (OR 2.57 [1.41-4.68]) were
associated with PICC-bloodstream infection. Catheter-lumens were strongly associated with this event (double-lumen, OR 5.21 [2.46-11.04] and triple lumen, OR 10.84 [4.38-26.82]). On multivariable analysis, only hospital length of stay, ICU status and number of PICC lumens remained significantly associated with PICC-bloodstream infection. Notably, the HR for PICC lumens increased substantially, suggesting earlier time to infection among patients with multi-lumen PICCs (HR 4.08 [1.51-11.02] and HR 8.52 [2.55-28.49] for double and triple lumen devices, respectively).

CONCLUSIONS: PICC-associated bloodstream infection is most associated with hospital length of stay, ICU status and number of device lumens. Policy and procedural oversights targeting these factors may be necessary to reduce the risk of this adverse outcome.

Other intravenous and vascular access resources that may be of interest (External links – IVTEAM has no responsibility for content).