Meta-analysis of subclavian insertion and nontunneled CVC infection risk


Abstract:

OBJECTIVE: Catheter-associated infections are common, costly, and potentially lethal. The impact of catheter insertion site on infection risk remains controversial. We aimed to establish whether nontunneled central venous catheters inserted in the subclavian vein are associated with lower risk of catheter-associated infection compared to femoral or internal jugular vein insertion.

DATA SOURCES: We searched MEDLINE (2000-2011), EMBASE (2000-2011), and Cochrane Library plus meta-analyses, gray literature, reference lists, and articles recommended by experts. STUDY SELECTION AND EXTRACTION: We selected peer-reviewed, randomized, or prospective cohort studies with systematic catheter culture using semiquantitative or quantitative catheter culture techniques and data available for catheter-associated infection by insertion site. Two reviewers independently performed study selection, assessed study quality, and extraction. Discrepancies were resolved by discussion and consensus. Outcomes were mean catheter duration and catheter-associated infection expressed as incidence density per 1000 catheter
days.

DATA SYNTHESIS:Â Ten studies (3250 subclavian, 3053 internal jugular, and 1554 femoral vein) met the inclusion criteria, one of which was randomized (136 subclavian vein and 134 femoral vein). Subclavian vein catheters were left in place significantly longer than alternative catheters (mean difference: 2 days, 95% confidence interval [0.9-3.1], I = 92%, p < .001). The subclavian vein site was associated with fewer catheter-associated infections (1.3 compared to 2.7 per 1000 catheter days for alternative sites, incidence density ratio 0.50; 95% confidence interval [0.33- 0.74], I = 0%, p < .001). The same was true when comparisons were stratified by alternative sites (subclavian vein vs. internal jugular vein, incidence density ratio 0.46; 95% confidence interval [0.30-0.70], I = 0%; subclavian vein vs. femoral vein, incidence density ratio 0.27; 95% confidence interval [0.15-0.48], I = 31%).

CONCLUSION:Â Shortcomings in study design, including channeling, confounding bias, and study heterogeneity, may limit the interpretation of our preliminary study results. Our analysis suggests that the subclavian site may be associated with a lower risk of catheter-associated infection. However, a large, randomized, controlled trial comparing each catheter site complication is warranted before the subclavian site can be unequivocally recommended as a first choice for central venous catheter insertion.