Decrease in central venous catheter placement due to use of ultrasound guidance for peripheral intravenous catheters


Abstract:

STUDY OBJECTIVES: Obtaining intravenous (IV) access in the emergency department (ED) can be especially challenging, and physicians often resort to placement of central venous catheters (CVCs). Use of ultrasound-guided peripheral IV catheters (USGPIVs) can prevent many “unnecessary” CVCs, but the true impact of USGPIVs has never been quantified. This study set out to determine the reduction in CVCs by USGPIV placement.

METHODS: This was a prospective, observational study conducted in 2 urban EDs. Patients who were to undergo placement of a CVC due to inability to establish IV access by other methods were enrolled. Ultrasound-trained physicians then attempted USGPIV placement. Patients were followed up for up to 7 days to assess for CVC placement and related complications.

RESULTS: One hundred patients were enrolled and underwent USGPIV placement. Ultrasound-guided peripheral IV catheters were initially successfully placed in all patients but failed in 12 patients (12.0%; 95 confidence interval [CI], 7.0%-19.8%) before ED disposition, resulting in 4 central lines, 7 repeated USGPIVs, and 1 patient requiring no further intervention. Through the inpatient follow-up period, another 11 patients underwent CVC placement, resulting in a total of 15 CVCs (15.0%; 95 CI, 9.3%-23.3%) placed. Of the 15 patients who did receive a CVC, 1 patient developed a catheter-related infection, resulting in a 6.7% (95 CI, 1.2%-29.8%) complication rate.

CONCLUSION: Ultrasound prevented the need for CVC placement in 85% of patients with difficult IV access. This suggests that USGPIVs have the potential to reduce morbidity in this patient population.
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