BLEEDING COMPLICATIONS OF CVC IN SEPTIC PATIENTS WITH ABNORMAL HEMOSTASIS

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Electronic health records (EHRs) were reviewed by 4 investigators.

Background
• Emergency physicians are prone to avoid central venous catheterization (CVC) in septic patients with known bleeding risks who are otherwise eligible for full early goal-directed therapy (EGDT) (Vinson DR, et al. West J Emerg Med; in press).
• This procedural disinclination is based on a perception of a significant risk of major bleeding, a risk thought sufficiently high to forego the benefits of thoracic central venous access and monitoring.
• An estimate of the incidence of hemorrhagic complications will help inform physicians’ risk/benefit calculus when considering central line placement in patients with hemostatic lab abnormalities.

Objectives
To measure the 24-hour incidence of major and minor bleeding complications in septic emergency department (ED) patients undergoing CVC for EGDT.

Setting and Inclusion Criteria
• This retrospective cohort study was undertaken from March 2010 to June 2012 in 21 community EDs.
• All septic patients undergoing ED CVC were included if they had one of the following:
  - Platelet count <100,000/μl;
  - International normalized ratio (INR) ≥ 1.3; or
  - Partial thromboplastin time ≥ 35 sec.
• Electronic health records (EHRs) were reviewed by 4 investigators.

Outcome Measures Definitions

Major hemorrhage:
• A new post-procedural fluid collection or enlargement in the pleural cavity, mediastinum, or neck, as confirmed by the staff radiologist’s final interpretation of plain films or computerized tomography imaging;
• Line-related bleeding causing hemodynamic compromise that required blood or fluid replacement, intotropes, or surgery.

Minor hemorrhage:
• Oozing from a percutaneous CVC puncture site;
• A superficial hematoma (visible or palpable).

Statistical Analysis
• Bivariate associations with bleeding complications
• Multiple logistic regression included variables based on the bivariate analyses results and clinical relevance
• Results are presented as odds ratios and inter-rater reliability reported as % agreement after independent review of a random selection of 5% of cases.

Results
Of the 2,612 patients undergoing ED CVC, 936 (35.8%) cases met inclusion criteria (Table 1). Mean age was 68.1 (±14.9) years; 535 (57.2%) were male. Two or more qualifying labs were present in 204 cases (21.8% of 936).

No. Platelet count (1,000/μl) INR level
≥936
≥1.3 768
≥1.3 and <2.0* 532
≥2.0 and <3.0† 139
≥3.0‡ 97
PTT ≥ 35 sec 72

Table 1: Distribution of hemostatic lab abnormalities

Statistical Analysis
• Overall 20 patients: failed access at initial site in 872 cases (93.2%).
• Failed access at the initial site is associated with complications:
  - Failed CVC at the initial site: 6.5 (3.1-13.8) vs. 1.0 (0.8-3.7) for the KP CREST Network Investigators

Strengths and Weaknesses
• Systematic review of comprehensive integrated EHR notes to 48 hours from ED arrival
• Sensitivity analysis of different definitions of mod-to-severe lab abnormalities yielded similar results
• Percent inter-rater agreement: 97.8% to 100%
• Ultrasound use was prevalent but poorly documented
• We suspect under-reporting of minor hemorrhage
• Unable to include cases of failed ED CVC, estimated to be approximately 13 cases during the study period

Conclusions
• Major bleeding from CVC among septic ED patients with abnormal hemostasis is rare.
• Minor bleeding is uncommon and infrequently requires intervention.
• Failed CVC at the initial site is associated with hemorrhagic complications.

Table 2: Odds ratios (ORs) of hemorrhagic complications

![Table 2: Odds ratios (ORs) of hemorrhagic complications](image-url)