Central venous catheter (CVC) placement is a standard procedure in critical care. Ultrasound guidance during placement is recommended by current guidelines, but there is no consensus on the best method for evaluating the correct CVC tip position. Recently, the “rapid atrial swirl sign” (RASS) has been investigated in a limited number of studies” Korsten et al (2018).

Abstract:

RATIONALE: Central venous catheter (CVC) placement is a standard procedure in critical care. Ultrasound guidance during placement is recommended by current guidelines, but there is no consensus on the best method for evaluating the correct CVC tip position. Recently, the “rapid atrial swirl sign” (RASS) has been investigated in a limited number of studies.

OBJECTIVES: We performed a prospective diagnostic accuracy study of focused echocardiography for the evaluation of CVC tip position in our medical ICU and IMC units.

METHODS: We performed a prospective diagnostic accuracy study in 100 patients admitted to the Intensive Care Unit and Intermediate Care Unit at our center. The first 10 subjects were assessed by one staff physician investigator (reference cohort), the remaining 90 patients by different residents (test cohort). All patients received a post-procedural chest radiograph (CXR) as gold standard. CVC placement was assessed with focused echocardiography performed by residents after a short training session. A rapid opacification of the right atrium (RASS) after injection of 10 mL of normal saline was regarded as “positive”, flush after more than two seconds was defined as “delayed”, no flush was a “negative” test result.

MEASUREMENTS AND MAIN RESULTS: Overall sensitivity of the RASS was 100% (95% CI 73.54-100%), specificity was 94.32% (CI 87.24-98.13%). Positive and negative predictive values were 70.59% (CI 44.04-89.09%) and 100% (CI 95.65-100%), respectively. Median time for echocardiographic testing was 5 minutes (1-28) in the whole cohort, CXRs were available after 49.5 minutes (13-254). Interrater agreement of the RASS was 0.77 (Cohen’s kappa), Measurement of CVC tip position was not different between two observers. Test
characteristics were similar among differently experienced residents.

CONCLUSIONS: Presence of the RASS by focused echocardiography showed excellent sensitivity and specificity and was equally performed by residents after minimal training. In patients with a positive RASS, routine CXR can be safely omitted, reducing time, costs and radiation exposure. A negative RASS should lead to a search for misplaced catheters.

CLINICAL TRIAL REGISTRATION: The study was registered with www.clinicaltrials.gov (NCT02661607).

Reference:

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