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Effect of a fluid bolus on cardiovascular collapse among critically ill adults undergoing tracheal intubation (PrePARE): a randomised controlled trial.

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Abstract

BACKGROUND: Tracheal intubation is common in the care of critically ill adults and is frequently complicated by hypotension, cardiac arrest, or death. We aimed to evaluate administration of an intravenous fluid bolus to prevent cardiovascular collapse during intubation of critically ill adults.

METHODS: We did a pragmatic, multicentre, unblinded, randomised trial in nine sites (eight ICUs and one emergency department) around the USA. Critically ill adults (≥18 years) undergoing tracheal intubation were randomly assigned (1:1, block sizes of 2, 4, and 6, stratified by study site) to either an intravenous infusion of 500 mL of crystalloid solution or no fluid bolus. The primary outcome, assessed in the intention-to-treat population, was cardiovascular collapse, defined as a new systolic blood pressure <65 mm Hg; new or increased vasopressor receipt between induction and 2 min after tracheal intubation; or cardiac arrest or death within 1 h of tracheal intubation. Adverse events were assessed in the as-treated population. This trial, which is now complete, is registered with ClinicalTrials.gov, number NCT03026777.

FINDINGS: Patients were enrolled from Feb 6, 2017, to Jan 9, 2018, when the data and safety monitoring board stopped the trial on the basis of futility. By trial termination, 337 (63%) of 537 screened adults had been randomly assigned. Cardiovascular collapse occurred in 33 (20%) of 168 patients in the fluid bolus group compared with 31 (18%) of 169 patients in the no fluid bolus group (absolute difference 1·3% [95% CI -7·1% to 9·7%]; p=0·76). The individual components of the cardiovascular collapse composite outcome did not differ between groups (new systolic blood pressure <65 mm Hg 11 [7%] in the bolus group vs ten [6%] in the no-bolus group, new or increased vasopressor 32 [19%] vs 31 [18%], cardiac arrest within 1 h seven [4%] vs two [1%], death within 1 h of intubation two [1%] vs one [1%]). In-hospital mortality was not significantly different in the fluid bolus group (48 [29%]) compared with no fluid bolus (59 [35%]).

INTERPRETATION: Administration of an intravenous fluid bolus did not decrease the overall incidence of cardiovascular collapse during tracheal intubation of critically ill adults compared with no fluid bolus in this trial.