Accuracy of pleth variability index to predict fluid responsiveness in mechanically ventilated patients: a systematic review and meta-analysis.

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To systemically evaluate the accuracy of pleth variability index to predict fluid responsiveness in mechanically ventilated patients. A literature search of PUBMED, OVID, CBM, CNKI and Wanfang Data for clinical studies in which the accuracy of pleth variability index to predict fluid responsiveness was performed (last update 5 April 2015). Related journals were also searched manually. Two reviewers independently assessed trial quality according to the modified QUADAS items. Heterogeneous studies and meta-analysis were conducted by Meta-Disc 1.4 software. A subgroup analysis in the operating room (OR) and in intensive care unit (ICU) was also performed. Differences between subgroups were analyzed using the interaction test. A total of 18 studies involving 665 subjects were included. The pooled area under the receiver operating characteristic curve (AUC) to predict fluid responsiveness in mechanically ventilated patients was 0.88 [95 % confidence interval (CI) 0.84-0.91]. The pooled sensitivity and specificity were 0.73 (95 % CI 0.68-0.78) and 0.82 (95 % CI 0.77-0.86), respectively. No heterogeneity was found within studies nor between studies. And there was no significant heterogeneity within each subgroup. No statistical differences were found between OR subgroup and ICU subgroup in the AUC [0.89 (95 % CI 0.85-0.92) versus 0.90 (95 % CI 0.82-0.94); P = 0.97], and in the specificity [0.84 (95 % CI 0.75-0.86) vs. 0.84 (95 % CI 0.75-0.91); P = 1.00]. Sensitivity was higher in the OR subgroup than the ICU subgroup [0.84 (95 % CI 0.78-0.88) vs. 0.56 (95 % CI 0.47-0.64); P = 0.00004]. The pleth variability index has a reasonable ability to predict fluid responsiveness.