

Reply to “Using Transthoracic Echocardiography to Predict Fluid Responsiveness after Passive Leg Raising Test: Caution Needed”

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Dear Sir,

Thank you for your valuable comments.

As you mentioned, performing passive leg raising (PLR) in infants and small children may be challenging. PLR was performed passively by the automatic raising of the bed's leg while simultaneously lowering the bed's head to the horizontal position (PLR). Ventilator settings (in ventilated patients), as well as infusion rates of inotropic/vasopressor agents and sedation/analgesia, were held constant during fluid bolus administration. The test was performed for patients whom fluid therapy was decided to be given based on the existence of at least one sign of poor tissue perfusion: (a) tachycardia defined as a mean heart rate >2 SD above normal for age, (b) decrease in blood pressure <5th percentile or systolic blood pressure <2 SD below normal for age, (c) urine output <0.5 mL/kg/hour, and (d) prolonged capillary refill: >5 seconds. Besides test was performed mainly on day 1 in which almost all patients were sedated on mechanical ventilation.

Second, about your concerns regarding the use of transthoracic echocardiography (TTE) to track the changes in velocity-time integral (VTI)/stroke volume (SV), echocardiography was performed by a 5-year experienced operator who received adequate training course in functional echocardiography for an intensivist. All results were reviewed instantaneously by a pediatric cardiologist who was blinded to the clinical condition of the studied patients and the purpose of the study. All readings were repeated in three consecutive cycles and results were averaged. A pilot study including 15 patients showed an excellent degree of intraobserver reliability in three baseline measurements of SV. The average measure intraclass correlation (ICC) was 0.93 [95% confidence interval (CI) = 0.91–0.95, $p < 0.001$].

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Patients having irregular dysrhythmia were excluded. And this was mentioned in the article. About the phase of respiration during obtaining measurements was difficult due to the relatively high respiratory rate in children under 5 years of age. However, all readings were repeated in three consecutive cardiac cycles, and results were averaged. About hand position, different views were used and they were mentioned in the method section.

About the least significant change (LSC) and precision of repeated values by same and different operators, you referred to Jozwiak et al. They included patients older than 18 years scheduled for neurosurgery, and SV was then determined by pulse contour analysis. They depend on stroke volume variation (SVV) which is reflected by arterial blood pressure changes in relation to the pattern of respiration. However, in El Nawawy et al., SV was evaluated before and after PLR, and change in SV (delta SV) was calculated. So, the comparison of delta SV to SVV does not make sense. Also, Jozwiak et al. obtained SV using ProAQT not echocardiography.