Validitas stroke volume variation dengan ultrasonic cardiac output monitor (USCOM) untuk menilai fluid responsiveness = Validity of stroke volume variation by ultrasonic cardiac output monitor (USCOM) to assess fluid responsiveness

I Nyoman Budi Hartawan, author

Abstrak

Latar belakang: Penilaian fluid responsiveness merupakan masalah dalam tatalaksana pasien, terutama pasien dengan penyakit kritis. Stroke volume variation (SVV) adalah parameter hemodinamik untuk menilai fluid responsiveness. Pengukuran SVV dapat dilakukan dengan USCOM, yang merupakan alat pemantauan hemodinamik non invasif berbasis ekokardiografi Doppler
Tujuan: Mengetahui nilai cut-off point (titik potong optimal) SVV dengan USCOM sebagai prediktor fluid responsiveness pada pasien yang bernapas spontan maupn dengan ventilasi mekanik.
Metode: Penelitan dilaksanakan di Pediatric Intensive Care Unit (PICU) dan UGD (Unit Gawat Darurat). Penelitian ini merupakan uji diagnostik dengan menggunakan peningkatan stroke volume (SV) setelah challenge cairan ringer laktat 10 ml/kg berat badan selama 15 menit sebagai indek. Subyek penelitian baik yang bernapas spontan maupun dengan ventilasi mekanik. Peningkatan nilai SV 10% disebut responder dan < 10% disebut non responder. Pengukuran SV dengan USCOM dilakukan sebelum dan setelah challenge, dan pengukuran SVV dilakukan sebelum challenge cairan.
Hasil: Sebanyak 73 pengukuran terhadap subyek di PICU dan UGD. Area under curve (AUC) untuk seluruh subyek adalah 85,6% (95% IK 77,1% - 94,1%), p < 0,05. Titik potong optimal SVV adalah 28,5%, dengan sensitivitas 81,8% dan spesisifitas 75,9%. AUC subyek ventilasi mekanik adalah 76,6% (95% IK 60,1%-93,1%), p < 0,05. Titik potong optimal SVV adalah 30%, dengan sensitivitas 72,7% dan spesisifitas 70%. AUC subyek dengan pernapasan spontan adalah 93,7% (95% IK 84,6% - 100%), p < 0,05. Titik potong optimal SVV 28,5%, dengan sensitivitas 90,9% dan spesisifitas 84,2%.
Simpulan USCOM memilki validitas yang baik untuk menilai SVV baik pada pasien bernapas spontan maupun dengan ventilasi mekanik.
<hr>
Background: Assessment of fluid responsiveness is a problem in the management of patients, particularly patients with critical illness. Stroke volume variation (SVV) is a hemodynamic parameter to assess fluid responsiveness. Measurement of SVV could be done by USCOM, which is a non-invasive hemodynamic monitoring tool based on Doppler echocardiography.
Objective: To determine the optimal SVV cut-off point measured by USCOM as a predictor of fluid responsiveness in spontaneously breathing and mechanically ventilated patients.
Methods: Research was conducted in the pediatric intensive care unit (PICU) and emergency room (ER). This study is a diagnostic test based on the increment of stroke volume (SV) after fluid challenge using Ringer's lactate 10 mL / kg body weight for 15 minutes as an index. The subjects are both spontaneously breathing and mechanically ventilated patients. Responders are those who experienced increment 10% from baseline SV, and non-responders are those who did not meet the criteria. Measurements of SV using USCOM were performed before and after fluid challenge, meanwhile SVV measurement was performed

before fluid challenge.
Results: A total of 73 measurements were performed at the PICU and ER. Area under the curve (AUC) for all subjects was 85.6% (95% CI 77.1% - 94.1%), p value <0.05. Optimal SVV cut-off point was 28.5%, with sensitivity of 81.8% and specificity 75.9%. In mechanically ventilated subgroup, the AUC was 76.6% (95% CI 60.1% -93.1%), p value <0.05. The optimal SVV cut-off point of this group was 30%, with sensitivity of 72.7% and specificity of 70%. Lastly, the AUC of subjects with spontaneous breathing was 93.7% (95% CI 84.6% - 100%), p value <0.05. The optimal SVV cut of point in this group was 28.5%, with sensitivity of 90.9% and specificity of 84.2%.
Conclusion: USCOM is valid for assessing SVV as a fluid responsiveness predictor, in patients with spontaneous breathing and mechanical ventilation.