Exploring the best predictors of fluid responsiveness in patients with septic shock.

Am J Emerg Med. 2017 Sep;35(9):1258-1261. doi: 10.1016/j.ajem.2017.03.052. Epub 2017 Mar 22.

Lu N(1), Xi X(2), Jiang L(1), Yang D(3), Yin K(4).

OBJECTIVE: To evaluate respiratory variations in carotid and brachial peak velocity and other hemodynamic parameters to predict responsiveness to fluid challenge.

METHODS: A prospective observational study was performed on mechanically ventilated patients with septic shock. Outcomes included the measurements of central venous pressure, intrathoracic blood volume index, stroke volume variation (SVV), pleth variability index(PVI), and ultrasound assessments of respiratory variations in inferior vena cava diameter (ΔIVC), carotid Doppler peak velocity (ΔCDPV), and brachial artery peak velocity (ΔVpeak brach).

RESULTS: All patients received 200 mL normal saline challenge. There were 27 responders and 22 non-responders. Responders had higher SVV, PVI, ΔIVC, ΔCDPV, and ΔVpeak brach measurements. In addition, all these measurements had statistically significant linear correlations with changes in cardiac index (CI).When responders were defined by ΔCI≥10%, receiver operating characteristics (ROC) curve analysis showed that fluid responsiveness could be predicted:11.5% optimal cut-off 1evels of SVV with sensitivity of 75% and specificity of 85%, 15.5% optimal cut-off 1evels of PVI with sensitivity of 65% and specificity of 80%, 20.5% optimal cut-off 1evels of ΔIVC with sensitivity of 67% and specificity of 77%, 13% optimal cut-off 1evels of ΔCDPV with sensitivity of 78%% and specificity of 90%, 11.7% optimal cut-off 1evels of ΔVpeak brach with sensitivity of 70% and specificity of 80%.

CONCLUSION: Ultrasound assessment of ΔIVC and ΔVpeak brach, especially ΔCDPV,

could predict fluid responsiveness and might be recommended as a continuous and noninvasive method to monitor functional hemodynamic parameter in mechanically ventilated patients with septic shock.