

Prediction of fluid Responsiveness in Mechanically Ventilated Children Undergoing Neurosurgery
Byon H.J., Lim C.W., Lee J.H., Park Y. H., Kim H.S., Kim C.S., Kim J.T. *BJA* 2013 Apr;110(4):586-91.

Background

The purpose of this study was to evaluate the clinical usefulness of static and dynamic variables for the prediction of fluid responsiveness in children under general anaesthesia.

Methods

Thirty-three mechanically ventilated children received 10 ml kg⁻¹ 21 colloid for 10 min while stable during surgery. Arterial pressure, heart rate, central venous pressure (CVP), and pleth variability index (PVI), in addition to variation in systolic pressure, pulse pressure (including Ddown and Dup), respiratory aortic blood flow velocity (DVpeak), and inferior vena cava diameter were measured before and after volume expansion. Patients were classified as responders to fluid loading if their stroke volume index (SVI) increased by at least 10%.

Results

There were 15 volume responders and 18 non-responders. Of the variables examined, DVpeak ($r=0.516$, $P=0.004$) and PVI ($r=0.49$, $P=0.004$) before volume expansion were significantly correlated with changes in SVI. The receiver-operating characteristic (ROC) curve analysis showed that PVI and DVpeak predicted fluid responsiveness. Areas under the ROC curves of PVI and DVpeak were statistically larger than that of CVP ($P=0.006$ and 0.014 , respectively). However, those of other variables were similar to that of CVP.

Conclusions

DVpeak and PVI can be used to predict fluid responsiveness in mechanically ventilated children under general anaesthesia. The other static and dynamic variables assessed in this study were not found to predict fluid responsiveness significantly in children.