



Effects of tidal volume challenge on the reliability of plethysmography variability index in hepatobiliary and pancreatic surgeries: a prospective interventional study

Background:

The plethysmography variability index (PVI) is a non-invasive, real-time, and automated parameter for evaluating fluid responsiveness, but it does not reliably predict fluid responsiveness during low tidal volume (V_T) ventilation. We hypothesized that in a 'tidal volume challenge' with a transient increase in tidal volume from 6 to 8 ml Kg^{-1} , the changes in PVI could predict fluid responsiveness reliably. **Method:**

We performed a prospective interventional study in adult patients undergoing hepatobiliary or pancreatic tumor resections and receiving controlled low V_T ventilation. The values for PVI, perfusion index, stroke volume variation, and stroke volume index (SVI) were recorded at baseline V_T of 6 ml Kg^{-1} , 1 min after the V_T challenge (8 ml Kg^{-1}), 1 minute after V_T 6 ml Kg^{-1} reduced back again, and then 5 minutes after crystalloid fluid bolus 6 ml kg^{-1} (actual body weight) administered over 10 minutes. The fluid responders were identified by SVI rise $\geq 10\%$ after the fluid bolus.

Results: The area under the receiver operating characteristic curve for PVI value change (ΔPVI_{6-8}) after increasing V_T from 6 to 8 ml Kg^{-1} was 0.86 (95% confidence interval, 0.76–0.96), $P < 0.001$, 95% sensitivity, 68% specificity, and with best cut-off value of absolute change (ΔPVI_{6-8}) = 2.5%.

Conclusion: In hepatobiliary and pancreatic surgeries, tidal volume challenge improves the reliability of PVI for predicting fluid responsiveness and changes in PVI values obtained after tidal volume challenge are comparable to the changes in SVI.



نوع البحث:

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