

The Ability of Pleth Variability Index to Predict Fluid Responsiveness in Mechanically Ventilated Patients under General Anaesthesia.

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Objective

To evaluate the ability of Pleth Variability Index (PVI) in predicting fluid responsiveness in mechanically ventilated patients under general anesthesia.

Methods

From August to November 2009, 25 patients were enrolled in this study following anesthesia induction. PVI was continuously displayed by the Masimo Radical-7. All patients were also monitored with Vigileo/FloTrac system. Haemodynamic data such as cardiac index (CI), stroke volume variability (SVV), mean arterial pressure, heart rate, central venous pressure, PVI, perfusion index were recorded before and after volume expansion (hetastarch 6%, 7 ml/kg). Fluid responsiveness was defined as an increase in CI $\geq 15\%$ ($\Delta CI \geq 15$).

Results

SVV and PVI were significantly higher in the responders ($16.0\% \pm 2.6\%$ and $20.5\% \pm 3.7\%$) than those in non-responders ($11.6\% \pm 1.4\%$ and $13.8\% \pm 2.6\%$) respectively ($P < 0.05$). The SVV threshold of 13.5% before volume expansion was able to discriminate the responders from the non-responders with a sensitivity of 88.2% and a specificity of 87.5%. The threshold for PVI was 15.5%, the same sensitivity of 88.2% and specificity of 87.5% were obtained. There was a significant relationship between PVI before volume expansion and change in CI after volume expansion ($r = 0.683$, $P < 0.01$), the same as the changes of SVV ($r = 0.600$, $P < 0.01$).

Conclusion

PVI as a new dynamic indices can predict fluid responsiveness non-invasively in mechanically ventilated patients during general anesthesia.