

Assessment of intrathoracic blood volume as an indicator of cardiac preload: single transpulmonary thermodilution technique versus assessment of pressure preload.

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Assessment of intrathoracic blood volume as an indicator of cardiac preload: Single transpulmonary thermodilution technique versus assessment of pressure preload parameters derived from a pulmonary artery catheter *

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Abstract

Objective: To analyze the clinical value of a new device (PiCCO) for cardiac output measurement and volume preload parameter assessment, based on transpulmonary thermodilution technique, as an alternative to the pulmonary artery thermodilution technique and assessment of pressure preload parameters derived from the pulmonary artery catheter. **Design:** Prospective, controlled, clinical study. **Setting:** University hospital. **Participants:** Eighteen patients with ejection fraction >50% undergoing

coronary artery bypass graft surgery. **Interventions:** A baseline measurement was performed after induction of anesthesia under clinical steady-state conditions (T1). Hypovolemia, defined as central venous pressure (CVP) <10 mmHg and pulmonary capillary wedge pressure (PCWP) <12 mmHg, was treated by infusion of 6% hydroxyethyl starch 200/0.5 (7 mL/kg). After 10 minutes, a second measurement (T2) was performed. **Measurements and Main Results:** The mean difference (bias) between transpulmonary thermodilution cardiac output and pulmonary artery thermodilution cardiac output did not differ at the 2 sample points. Changes in pressure preload parameters of the pulmonary artery catheter (CVP, PCWP) did not correlate with changes in cardiac output or stroke volume, whereas changes in volume preload parameter intrathoracic blood volume (ITBV) of the PiCCO correlated significantly with changes in cardiac output and stroke volume ($r = 0.55, p < 0.05$; $r = 0.62, p < 0.01$). **Conclusion:** These results suggest that increased cardiac preload is more reliably reflected by ITBV than by CVP or PCWP. The assessment of ITBV by the transpulmonary single indicator dilution technique is an interesting alternative to the pressure preload parameters. *Copyright © 2001 by W.B. Saunders Company*



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Keywords

cardiac surgery; cardiac output; preload; intrathoracic blood volume

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Assessment of intrathoracic blood volume as an indicator of cardiac preload: single transpulmonary thermodilution technique versus assessment of pressure preload, spatial-temporal organization accelerates the initial stress.

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