Accuracy of a Novel Approach to Measuring Arterial Thermodilution Cardiac Output During Intra-Aortic Counterpulsation.

Summary / Zusammenfassung
The aim of this study was to assess the agreement between a novel approach of arterial and the pulmonary artery bolus thermodilution for measuring cardiac output in critically ill patients during aortic counterpulsation. Eighteen male patients aged 37-80 years, undergoing preoperative insertion of an intra-aortic balloon pump (IABP) and elective coronary artery bypass grafting. A 1.3FG thermistor was introduced through the pressure lumen to the tip of an 8FG IABP catheter, and the pump rate was set at 1:1. After arrival in the intensive care unit cardiac output (CO) was measured under haemodynamic steady-state conditions hourly for 8-11 h, and arterial bolus thermodilution (BCO(iabp)) and pulmonary artery bolus thermodilution (BCO(pulm)) were determined after the patients’ admission to the intensive care unit.

A total of 198 data pairs were obtained: 177 with aortic counterpulsation and 21 without. During aortic counterpulsation, median CO was 6.8 l/min for BCO(iabp) and 6.1 l/min for BCO(pulm), without aortic counterpulsation; corresponding values were 7.1 l/min for BCO(iabp) and 6.5 l/min for BCO(pulm) with aortic counterpulsation. Mean bias was +0.77 l/min, limits of agreement (±2 SD) were -1.27+/2.81 l/min, and mean error (2 SD/[(BCO(iabp) + BCO(pulm))/2] was 31.4%. Without aortic counterpulsation, corresponding values were +0.43 l/min, -1.03+/1.87 l/min, and 22.4%.

In conclusion, agreement between BCO(iabp) and BCO(pulm) was satisfactory for CO values between 2.0 and 10 l/min only without aortic counterpulsation. BCO(iabp) CO measurements during aortic counterpulsation after coronary artery bypass grafting cannot be recommended at the present time.

Publications / Publikationen

Keywords / Suchbegriffe
transthoracic thermodilution CO, pulmonalarterial thermodilution CO, intraaortic counterpulsation

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Funding Source(s) / Unterstützt durch
In Cooperation with Oliver Gödje, Fa. PULSION, München

Duration of Project / Projektdauer
May 2003 to Mar 2006