

Continuous and intermittent cardiac output measurement in hyperdynamic conditions: pulmonary artery catheter vs. lithium dilution technique

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Objective: This study aimed to assess the level of agreement of both intermittent cardiac output monitoring by the lithium dilution technique (CO(Li)) and continuous cardiac output monitoring (PulseCO(Li)) using the arterial pressure waveform with intermittent thermodilution using a pulmonary artery catheter (CO(PAC)).

Design: Prospective, single-center evaluation.

Setting: University Hospital Intensive Care Unit.

Patients: Patients (n=23) receiving liver transplantation.

Intervention: Pulmonary artery catheters were placed in all patients and CO(PAC) was determined using thermodilution. CO(Li) and PulseCO(Li) measurements were made using the LiDCO system.

Measurements and main results: Data were collected after intensive care unit admission and every 8h until the 48th hour. A total of 151 CO(PAC), CO(Li) and PulseCO(Li) measurements were analysed. Bias and 95% limit of agreement were 0.11 lmin⁻¹ and -1.84 to + 2.05 lmin⁻¹ for CO(PAC) vs. CO(Li) (r=0.88) resulting in an overall percentage error of 15.6%. Bias and 95% limit of agreement for CO(PAC) vs. PulseCO(Li) were 0.29 lmin⁻¹ and -1.87 to + 2.46 lmin⁻¹ (r=0.85) with a percentage error of 16.8%. Subgroup analysis revealed a percentage error of 15.7% for CO(PAC) vs. CO(Li) and 15.1% for CO(PAC) vs. PulseCO(Li) for data pairs less than 8 lmin⁻¹, and percentage errors of 15.5% and 18.5% respectively for data pairs higher than 8 lmin⁻¹.

Conclusion: In patients with hyperdynamic circulation, intermittent and continuous CO values determined using the LiDCO system showed good agreement with those obtained by intermittent pulmonary artery thermodilution.