

Lithium dilution cardiac output measurement: a comparison with thermodilution

Linton R, Band D, O'Brien T, Jonas M, Leach R. *Crit Care Med.* 1997 Nov;25(11):1796-800. doi: 10.1097/00003246-199711000-00015.

Objective: To compare the results of cardiac output measurements obtained by lithium dilution and thermodilution.

Design: Case series, observational study.

Setting: High-dependency postoperative unit and intensive care unit of a teaching hospital.

Patients: Forty patients were studied. Thirty-four patients had undergone heart surgery requiring cardiopulmonary bypass within the previous 2 days; the diagnoses in the other patients were myocardial infarct (n = 2), septicemia (n = 2), adult respiratory distress syndrome, and pericardectomy.

Interventions: Cardiac output was measured five times in each patient, using lithium dilution (single measurement) and bolus thermodilution (series of three to six measurements according to standard clinical practice, taking the average of the closest three). In a subgroup of 14 patients, cardiac output was also measured using "continuous thermodilution."

Measurements and main results: Comparing lithium dilution with bolus thermodilution, the mean of the differences (lithium dilution-thermodilution) was -0.25 ± 0.46 [SD] L/min. Linear regression analysis gave $y = 0.31 + 0.89x$ ($r^2 = .94$) for lithium dilution vs. thermodilution.

Conclusions: The overall agreement between the two methods was good. The variability of the thermodilution measurements was greater than that of the lithium dilution measurements. The lithium dilution method is at least as accurate as bolus thermodilution and, since pulmonary artery catheterization is not needed, it has the advantages of being safe and quick to perform.