

Intravascular Microdialysis as a Method for Measuring Glucose and Lactate during and after Cardiac Surgery

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Abstract

Background:

The aim was to evaluate intravascular microdialysis as a method for measuring blood glucose and lactate in a clinical setting during and after cardiac surgery.

Methods:

Ten patients undergoing cardiac surgery were included. A microdialysis catheter was percutaneously placed in the superior vena cava or right atrium. Glucose and lactate values measured by the microdialysis technique were analyzed and compared with reference methods, i.e., arterial and venous blood gas values, once every hour up to 24 hours postoperatively. Laboratory plasma glucose was additionally analyzed every 4 hours for reference value.

Results:

Mean absolute differences were low between microdialysis and reference methods for both glucose and lactate values. All microdialysis glucose values were in the clinically acceptable zone of error grid analysis when compared with plasma glucose values. Accuracy of glucose values was 92% according to International Organization for Standardization criteria.

Conclusions:

Intravascular microdialysis is a novel and promising technique for real-time and accurate measurement of glucose and lactate during and after open heart surgery. Development of sensor technology may allow for continuous measurement of blood glucose and lactate using intravascular microdialysis.

J Diabetes Sci Technol 2011;5(5):1099-1107

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Abbreviations: (CI) confidence interval, (CVC) central venous catheter, (CVP) central venous pressure, (EGA) error grid analysis, (IIT) intensive insulin therapy, (ISO) International Organization for Standardization, (SICU) surgical intensive care unit

Keywords: glucose, heart surgery, lactate, microdialysis

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