

Pulse Oximeter-Derived Pleth Variability Index is a Reliable Indicator of Cardiac Preload in Patients Undergoing Liver Transplantation.

Transplant Proc. 2016 May;48(4):1055-8. doi: 10.1016/j.transproceed.2015.12.106.

Lee HC(1), Tsai YF(1), Tsai HI(1), Chung PC(2), Yu HP(1), Lee WC(3), Lin CC(4).

Author information:

(1)Department of Anesthesiology, Chang Gung Memorial Hospital, Taoyuan, Taiwan, ROC; College of Medicine, Chang Gung University, Taoyuan, Taiwan, ROC; Graduate Institute of Clinical Medical Sciences, Chang Gung University, Taoyuan, Taiwan, ROC. (2)Department of Anesthesiology, Chang Gung Memorial Hospital, Taoyuan, Taiwan, ROC. (3)College of Medicine, Chang Gung University, Taoyuan, Taiwan, ROC; Division of Transplantation and Liver Surgery, Department of General Surgery, Chang Gung Memorial Hospital, Taoyuan, Taiwan, ROC. (4)Department of Anesthesiology, Chang Gung Memorial Hospital, Taoyuan, Taiwan, ROC; College of Medicine, Chang Gung University, Taoyuan, Taiwan, ROC; Graduate Institute of Clinical Medical Sciences, Chang Gung University, Taoyuan, Taiwan, ROC.
Electronic address: chihchung@cgmh.org.tw.

BACKGROUND: Accurate estimation of cardiac preload during liver transplantation is essential. The right ventricular end-diastolic volume index (RVEDVI) is recognized as a good preload indicator in patients undergoing liver transplantation. Recently, dynamic variation parameters including pleth variability index (PVI) have been used as predictors of fluid responsiveness. However, the correlation between PVI and preload status has not been well studied. We evaluated the relationship between PVI and RVEDVI during liver transplantation.

METHODS: Eighteen patients undergoing liver transplantation were enrolled in this study. Data of hemodynamic parameters including PVI derived by Masimo Rainbow SET Pulse CO-Oximeter, central venous pressure (CVP), pulmonary arterial occlusion pressure (PAOP), and RVEDI were obtained at 10 defined time points throughout liver transplantation. The correlation between RVEDVI and CVP, PAOP, and PVI was analyzed using Spearman rank test. We also investigated the ability of PVI to accurately differentiate RVEDVI <123 or >142 mL/m² using receiver operating characteristic (ROC) analysis.

RESULTS: There was fair to good correlation between PVI and RVEDVI (correlation coefficient = -0.492, P < .001). The correlation coefficient between CVP, PAOP, and RVEDVI was 0.345 and 0.463, respectively. A 13.5% cutoff value of PVI estimated the RVEDVI <123 mL/m² (area under the curve [AUC] = 0.762). A 12.5% cutoff value of PVI estimated the RVEDVI >142 mL/m² (AUC = 0.745).

CONCLUSIONS: PVI presented as a reliable estimate of preload status and may be a useful predictor of fluid responsiveness in patients undergoing liver transplantation.