Intraoperative Pleth Variability Index Predicts Delayed Graft Function

Jazaerli, L., Heshmati N., Collange O., Biermann C., Lejay A., M.D., Muller C., Sauleau E., Mertes P., Steib A. *Proceedings of the American Society of Anesthesiologists*, October 16, 2013. San Francisco; A2213

Introduction

Delayed graft function (DGF, absence of 10% decrease of creatinemia at D2) is one of the most significant complications after kidney transplant and is associated to graft loss and increased morbidity and mortality. Appropriate intraoperative hemodynamic management is essential for post-transplant renal function. Central venous pressure (CVP) is frequently used to evaluate intraoperative blood volume, but there is little clinical evidence to justify its use in renal transplantation. Pleth Variability Index (PVI) is a noninvasive hemodynamic parameter that has been shown to predict fluid responsiveness in surgical and ICU patients, in place of CVP, but has not been evaluated during kidney transplantation. The aim of our study was to determine if either intraoperative PVI or CVP values could predict DGF.

Materials and methods

A prospective, non-interventional, observational, single-center study was conducted after obtaining ethics committee approval and informed consent. Demographic information was collected from all recipients and donors. Recipients received standard ASA monitoring and were also monitoring with PVI with a adhesive, spectrophotometric finger sensor attached to a Pulse CO-Oximeter (Radical-7, SET sw ver 7801 with Adtx finger disposable sensor, Masimo Corp., Irvine, CA) .Intraoperative hemodynamic parameters were recorded from recipients at five time points during the procedure : 1) before incision, 2) 1hour after incision 3) before unclamping 4) after declamping of the renal artery and, 5) closure. Mean±standard deviation CVP and PVI values at each time point were compared by regression analysis and for the ability of changes in CVP or PVI to predict DGF.

Results

Thirty-five patients were enrolled between August 2012 and February 2013. There was a poor correlation between PVI and CVP at four of the five time points and no correlation between CPV and PVI before declamping of the renal artery ($p = 0.70$). In patients with DGF, intraoperative PVI values were significantly higher ($9.3 \pm 6\%$ [7.9, 10.8] vs. $6.5 \pm 2.8\%$ [5.9, 7], $p = 0.018$). In particular, a PVI> 8.3% [6.1 to 10.1] before declamping of the renal artery was significantly related to the occurrence of DGF ($p = 0.037$).

Conclusion

DGF is a common and serious complication after renal transplantation. It would be important to identify pre- or intraoperative correlates of DGF: so risk factors could perhaps be mitigated to improve outcomes. This study suggests that PVI values greater than 8% may predict DGF in these patients. Additional studies are needed to determine how this information can be used to improve patient care.