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Editorial

The Safety and Utility of Dobutamine Stress Echocardiography for Pre-operative Risk Stratification in Orthotopic Liver Transplantation

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Current guidelines recommend stress echocardiography as a primary tool to evaluate the presence of coronary artery disease (CAD).[1)2)] Although stress echocardiography is useful to predict the prognosis in patients with valvular heart disease or various cardiomyopathy, its major role is still stratification of CAD risk. Indications for dobutamine stress echocardiography (DSE) are broad such as predicting the CAD and risk stratification of patients undergoing non-cardiac surgery. DSE is a widely used tool for perioperative cardiac risk evaluation. DSE can provide clinical information about not only the risk of CAD, but also diastolic reserve or hemodynamic alteration such as dynamic intraventricular obstruction. Diastolic function is a crucial determinant of cardiovascular events such as heart failure after high-risk surgery. Volume overload during perioperative period could contribute to cardiovascular events in patients with exaggerated diastolic dysfunction during DSE. In addition, dynamic intraventricular obstruction is another hemodynamic determinant as in patients with obstructive hypertrophic cardiomyopathy, which may cause hypotension or heart failure after surgery. It can also be easily found with simple and safe Valsalva maneuver during DSE.[3)]

The risk of CAD is higher and hemodynamic instability is common in patients with end-stage liver disease compared with general population.[4)] Liver transplantation is a high-risk surgery (>5% of 30-day risk of cardiovascular death and myocardial infarction) which often result in hemodynamic instability including bleeding and concomitant cardiac stress.[5)] Cardiovascular event is a crucial contributing factor of prognosis after orthotopic liver transplantation (OLT). Therefore, perioperative risk stratification including hemodynamic status is important to improve the prognosis after any non-cardiac surgery including OLT. Imaging stress testing is recommended before high-risk surgery in patients with ≥3 clinical risk factors and poor functional capacity (<4 metabolic equivalents [METs]) with class I recommendation.[6)] In this issue of the Journal, Agrawal et al.[7)] investigated the utility of DSE in predicting perioperative cardiovascular morbidity and mortality after OLT. Authors reported high negative predictive value of the preoperative DSE in predicting perioperative major adverse cardiovascular events in 118 patients undergone after OLT. They also reported the relatively low complication rate associated with DSE. In this study, no life-threatening events and fatal arrhythmic events occurred. DSE was relatively safe as previous study reported the incidence of potentially life-

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threatening complications as <0.01%.[8] Therefore, DSE could be performed safely, and can provide useful information about the perioperative cardiovascular risk in patients undergoing OLT who are at high-risk for perioperative cardiovascular events. However, DSE has limitations in the prediction of CAD in patients undergoing OLT.[9][10] DSE is not a sensitive screening test for both preoperative CAD evaluation and perioperative cardiac events in patients undergoing OLT. Evolving non-invasive imaging technologies including cardiac magnetic resonance or nuclear scan may provide more useful information for the assessment of cardiovascular risk in these special population.

Cardiovascular event is an important factor to determine the prognosis after OLT. DSE is safe and useful for predicting perioperative cardiovascular risk, but it has low sensitivity and high negative predictive value predicting future cardiovascular events in patients undergoing OLT. We need a more sensitive novel imaging test, and prospective large-scale, long-term follow-up studies to support more confident risk stratification, and favorable treatment strategies in patients with non-cardiac high-risk surgery such as OLT.

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