Predictors of Perioperative Vasoactive Drug Requirement During Retroperitoneal Adrenalectomy for Pheochromocytoma: A Retrospective Exploratory Study

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Background:

Anesthetic management for pheochromocytoma resection is a challenge for anesthesiologists. Despite the long history of treatment cateholamin-producing tumors, there isn't reliable method for predicting hospital complications (intraoperative or postoperative). The main problems for the anesthesiologist during adrenalectomy are hypertension while the tumor is mobilizing and hypotension after resection. According to latest researches preoperative adrenergic activity, tumor size and dose of alpha-blockers may be predictors for hemodynamic instability. We suggested that hyperproduction of catecholamines may increase systemic vascular resistance, and so it can be predictor of hypo- or hypertension. The aim of present study was to test a hypothesis that baseline systemic vascular resistance index (SVRI) assessed by method of transpulmonary thermodilution predicts perioperative requirement for vasoactive drugs.

Methods.

The primary outcomes were: (1) peak vasoactive-inotropic score (VIS, recalculation of all used sympathomimetics to the equivalent of norepinephrine) and (2) peak dose of hypotensive drugs at any stage of surgery. The main exposure variable was baseline SVRI. Hemodynamics were retrospectively assessed by transpulmonary thermodilution in 50 adults undergone posterior retroperitoneal surgery for pheochromocytoma.

Results.

Univariate linear regression analysis showed predictive value of SVRI on VIS (regression coefficient, 95% CI; 0.024 (0.005, 0.4), p=0.015). Other significant factors were the history of peak diastolic pressure, baseline MAP, baseline betablocker therapy, and history of coronary artery disease (CAD). After adjustment of SVRI for the history of CAD, its prognostic value became non-significant (0.018 (0.008, 0.03), p=0.063 and 29.6 (19, 40.2), p=0.007 for SVRI and history of CAD respectively). Requirements of vasodilators were predicted by baseline adrenergic activity (0.37 (0.005, 0.74), p=0.047).

Conclusion.

In conclusion, baseline SVRI is associated with perioperative requirement of vasopressor drugs, but history of CAD is a stronger prognostic factor for vasopressor support. Perioperative requirement in vasodilators is associated with baseline adrenergic activity. Of course, transpulmonal thermodilution is very expensive and invasive method The evaluation of indications for extensive hemodynamic monitoring and its role in enhancing patient safety should be validated through further prospective trials.