Preoperative Concentration of Serum Adrenaline Is an Independent Predictor of Refractory Hypotension in Patients with Pheochromocytoma after Tumor Resection

Introduction and Objective: Hypotension is a frequent event in patients with pheochromocytoma after tumor resection despite the agents used for perioperative control of blood pressure. Although hypotension is generally treated with aggressive volume expansion and direct-acting α-adrenergic agonists, such as dopamine, adrenaline, or noradrenaline, hypotension is sometimes refractory to these agents. The aim of this study was to identify the predictive factors that were associated with refractory post-resection hypotension that required catecholamine support in patients with pheochromocytoma.
Materials and Methods: Records of 48 Japanese patients who underwent unilateral laparoscopic adrenalectomy for pheochromocytoma were surveyed retrospectively from 2001 to 2012. Cardiologists confirmed normal heart function in all patients with pheochromocytoma before surgery. To exclude an influence of refractory hypotension caused by significant intraoperative blood loss, this study included laparoscopic surgery only, in which patients had lesser blood loss. Catecholamine support started when patients had post-resection hypotension (systolic blood pressure <90 mmHg) in spite of fluid resuscitation. We divided the patients into two groups according to whether catecholamine support was necessary for refractory post-resection hypotension or not postoperatively. After candidate variables were selected based on univariate analyses, multivariate logistic regression analysis was performed to identify clinical predictors associated with refractory hypotension.
Results: After surgery, 43.8% of the patients continued to require catecholamine support to keep blood pressure normal. According to univariate analyses, the predictive factors associated with refractory hypotension included duration of hypertension, hypertensive crisis, preoperative number of antihypertensive drugs, fasting blood glucose level, and levels of serum total cholesterol, serum adrenaline, serum noradrenaline, and urine noradrenaline (P <0.05). Multivariate logistic regression analysis identified preoperative concentration of serum adrenaline ≥300 pg/mL as an independent predictor of refractory post-resection hypotension (P <0.05; odds ratio, 16.65).
Conclusions: Preoperative concentration of serum adrenaline ≥300 pg/mL was shown to be an independent predictor of refractory post-resection hypotension in patients with pheochromocytoma. Clinicians can pay attention to patients at greater risk of refractory hypotension when they refer to these data.