**β-Adrenergic Agonist Administration is Not Associated With Secondary Intraoperative Carcinoid Crises in Patients With Carcinoid Tumor**

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**Background:**
Patients with carcinoid tumors are prone to intraoperative hemodynamic instability from carcinoid crises. The physiology of these events is poorly understood, but hormone and catecholamine release are believed to trigger crises. 1 Concern that administration of β-adrenergic agonists could thus trigger paradoxical hypotension by causing additional hormone release (secondary crises) complicates management of these events. 2, 3

Effectively treating hypotension is critical; prolonged instability in these patients is associated with serious sequelae including death. 4 Crisis treatments include octreotide, fluid resuscitation, H1/H2 blockade, and steroids, but vasopressors are often needed as well. Exclusive use of phenylephrine and vasopressin is a common strategy to avoid paradoxical hypotension, but there is little data to support this approach. 1,3,4,6

**Objectives:**
What is our institutional experience with vasopressors in carcinoid patients with crises? Do we observe vasopressor induced crisis (VIC) from intraoperative β-agonist use?

**Methods:**
Anesthesia records were reviewed for carcinoid patients between 2011 and 2014 who had crises and were treated with vasopressors. We defined “paradoxical hypotension” as MAP drop of ≥20% anytime in the 15 minutes following drug administration. Statistical analysis was performed using χ2 and T-tests. P<0.05 was considered significant.

**Results:**
44 operations were examined. In 25 operations the patient received only phenylephrine and/or vasopressin, in 19 operations β-Adrenergic agonists were used. One patient had a history of carcinoid heart disease. No patients had significant pre-operative heart failure. Ephedrine was used 26 times, epinephrine was used 40 times, norepinephrine was used 9 times, phenylephrine was used 222 times, and vasopressin was used 116 times.

**Paradoxical hypotension was not associated with use of β-adrenergic agonists as compared to phenylephrine or vasopressin (p=0.259). There was a trend towards hypotension being more frequent after phenylephrine or vasopressin (16.7% vs. 10.6%). The magnitude of MAP decrease after drug administration, when present, was between 4-9% for all medications (all differences NS).**

**Conclusions:**
β-adrenergic agonists did not worsen hemodynamics, with a trend towards less frequent hypotension after these medications. β-adrenergic agonists did not take longer to correct hypotension.

**Recommendations:**
No changes to first line therapy

Use β-adrenergic agonists for life threatening instability if phenylephrine and vasopressin are failing

**References:**
3) Kent ME. Anesthesia for the carcinoid syndrome. AANA journal. Apr 1983;51(2):150-153

**Duration of instability, when present, was not significantly different between β-agonists (9.6 min) and phenylephrine/vasopressin (8.6 min). No dose-response relationship was detected for any of the drugs with change in MAP. β-Adrenergic agonist use was not associated with paradoxical hypotension.**