

Abstract 1

Pulmonary Hypertension Is an Important Predictor of Perioperative Outcomes in Patients Undergoing Noncardiac Surgery

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Rationale: Pulmonary hypertension (PH), although considered high risk, is not currently recognized as an independent risk factor for perioperative outcomes after noncardiac surgery (NCS).

Objectives: We report perioperative complications and their associated risk factors from a large cohort of patients with angiographically proven PH.

Methods: Patients undergoing NCS between January 2002 and December 2006 were cross-matched with a pulmonary artery catheterization (PAC) database for the same period. Patients were excluded if they were < 18 years old or if they underwent cardiac surgery prior to NCS or minor procedures using local anesthesia/sedation. A comparable number of controls with mean pulmonary arterial pressure (MPAP) < 25 mm Hg who underwent similar surgeries were used for analysis. Multivariate logistic regression was used to identify clinical, echocardiographic, and angiographic characteristics associated with perioperative morbidity and mortality (**Table, next page**).

Results: Out of a total of 5,445 patients who underwent PAC, 526 underwent NCS during the specified period. Of these, 96 patients had PH. MPAP ($P = .001$), American Society of Anesthesiologists (ASA) class ($P = .02$), and chronic renal insufficiency ($P = .03$) were determined as independent risk factors for postoperative morbidity. Of the 27 patients with significant perioperative complications, which included 1 death, 25 (92.6%) had underlying PH. Patients with PH were more likely to develop congestive heart failure ($P < .001$; OR: 11.9), hemodynamic instability ($P < .002$), sepsis ($P < .0005$), and respiratory failure ($P < .004$). Patients with PH needed longer ventilatory support ($P < .002$), stayed longer in the ICU ($P < .04$), and were more frequently readmitted to the hospital within 30 days ($P < .008$; OR: 2.4).

Conclusions: Underlying PH can have a significant impact on perioperative outcomes after NCS. Patients with pulmonary arterial hypertension and “mixed PH” had a higher likelihood of such complications when compared to patients with pure pulmonary venous hypertension.

TABLE
Multiple logistic regression for morbidity/mortality for all patients

| Characteristic | Odds ratio* | P value |
|--------------------------------------|------------------------------|---------|
| Cardiac risk index (with vs without) | 3.9 | .01 |
| ASA class (> 2 vs ≤ 2) | 3.2 | .04 |
| Surgical risk class | 7.5 (3 vs 1) 1.5 (2 vs 1) | .03 |
| MPAP | 5.9 | .02 |
| Pulmonary vascular resistance | — | .06 |

*Area under the receiver operator characteristic curve: .81