8-2020

Intraoperative Hypotension and Acute Kidney Injury in Non-Cardiac Surgery at Providence Sacred Heart Medical Center

Elizabeth Davison  
*Providence Sacred Heart Medical Center & Gonzaga University School of Anesthesia,*  
Elizabeth.Davison@providence.org

Amanda Affleck  
*Providence Sacred Heart Medical Center & Gonzaga University School of Anesthesia,*  
amanda.affleck@providence.org

Kenn B Daratha  
*Providence Health Care, Nephrology Division, Kidney Research Institute, Spokane, Washington,*  
kenneth.daratha@providence.org

Follow this and additional works at: [https://digitalcommons.psjhealth.org/other_pubs](https://digitalcommons.psjhealth.org/other_pubs)

Part of the Anesthesiology Commons, Medical Education Commons, and the Nursing Commons

**Recommended Citation**  
Davison, Elizabeth; Affleck, Amanda; and Daratha, Kenn B, "Intraoperative Hypotension and Acute Kidney Injury in Non-Cardiac Surgery at Providence Sacred Heart Medical Center" (2020). *Books, Presentations, Posters, Etc..* 110.  
[https://digitalcommons.psjhealth.org/other_pubs/110](https://digitalcommons.psjhealth.org/other_pubs/110)

This Poster is brought to you for free and open access by Providence St. Joseph Health Digital Commons. It has been accepted for inclusion in Books, Presentations, Posters, Etc. by an authorized administrator of Providence St. Joseph Health Digital Commons. For more information, please contact digitalcommons@providence.org.
Intraoperative Hypotension and Acute Kidney Injury in Non-Cardiac Surgery at Providence Sacred Heart Medical Center

Elizabeth Davison, BSN, RN; Amanda Affleck, DNAP, CRNA; Kenn B. Daratha, PhD
Providence Sacred Heart Medical Center & Gonzaga University School of Anesthesia

**Background**

Acute kidney injury (AKI) is a serious postoperative complication that increases a patient’s risk for both long and short-term morbidity and mortality.1 Intraoperative hypotension (IOH) is an independent risk factor for both AKI,2,3 which can be readily modified by anesthesia providers.

This project aims to describe the risk factors and rates of AKI following IOH at various absolute mean arterial blood pressure (MAP) thresholds for specified durations of time among adults undergoing non-cardiac surgery at Providence Sacred Heart Medical Center (PSHMC).

**Methods**

- **PSHMC** approved this retrospective, observational evidence-based project and deemed exempt by the Institutional Review Board from human subjects testing.
- **Inclusion Criteria:** Adults undergoing general anesthesia for non-cardiac surgery at PSHMC from 2015-2019 with pre- and postoperative serum creatinine lab results to evaluate for AKI via KDIGO Criteria
- **Exclusion Criteria:** Obstetrics, Urology, Dialysis history
- The study group was further stratified by recorded MAP
- MAP < 60mmHg
- MAP < 40mmHg
- MAP < 50mmHg
- MAP < 55mmHg
- General
- Vascular
- Orthopedics
- Neurology
- Other Service Line

**Table 1. Demographic and Clinical Characteristics**

<table>
<thead>
<tr>
<th>Variable</th>
<th>OR</th>
<th>95% CI</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAP &lt; 60mmHg ≥ 10 minutes</td>
<td>1.18</td>
<td>1.18–1.92</td>
<td>0.001</td>
</tr>
<tr>
<td>ASA 4+</td>
<td>1.13</td>
<td>1.13–2.03</td>
<td>0.001</td>
</tr>
<tr>
<td>Chronic Kidney Disease</td>
<td>1.00</td>
<td>1.00–1.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Baseline eGFR &lt; 60</td>
<td>5.00</td>
<td>3.49–7.16</td>
<td>0.001</td>
</tr>
</tbody>
</table>

**Findings**

**Figure 1. Risk for AKI Following IOH at PSHMC**

- **Table 2. Rates of AKI at PSHMC**

<table>
<thead>
<tr>
<th>MAP Time (min)</th>
<th>AKI (n=310)</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;60</td>
<td>210 (68%)</td>
<td>0.001</td>
</tr>
<tr>
<td>≥20</td>
<td>613 (77%)</td>
<td>0.001</td>
</tr>
</tbody>
</table>

**Discussion**

Project findings revealed that 8.3% of patients had both pre- and postoperative serum creatinine results to evaluate for AKI. Of this study population (n=4,603), 8.9% experienced postoperative AKI. The literature reports rates of AKI to be 5-7.5%. Risk for AKI increased from 7.7% to 11.3% among patients exposed to MAPs less than 60mmHg for at least 10 minutes (RR 1.48, 95% CI [1.19-1.84], p<0.001). According to the literature, AKI risk increases with the duration and severity of IOH exposure.

In a fully adjusted model, IOH, ASA 4 or greater, history of chronic kidney disease, baseline eGFR less than 60 ml/min/1.73m², and vascular surgery were identified as independent risk factors for AKI at PSHMC.

Exploring AKI rates and risk factors at PSHMC helps identify potential areas of anesthesia practice improvement and informs further research surrounding AKI. As blood pressure is a modifiable risk factor for AKI, limiting IOH exposure may mitigate end organ damage and improve patient outcomes.

**References**