

Fluid sparing intraoperative resuscitation is safe in selected general surgical procedures: a natural experiment in the setting of an IV fluid supply shock

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INTRODUCTION

Intravenous fluid (IVF) restriction has become a major focus of postoperative outcomes research. It is recognized as a key component of the “Enhanced Recovery After Surgery” (ERAS) protocol in colorectal surgery with the aim of minimizing complications, reducing length of stay, and promoting faster recovery.¹ Currently, standardized practices for intraoperative fluid administration are lacking within institutions and at the national level.² The advantages of restrictive approaches relative to liberal strategies remain disputed, given concerns about postoperative acute kidney injury (AKI).³ The question of whether fluid management is best achieved through restriction, specific thresholds, or goal-directed targets continues to be debated.

OBJECTIVE

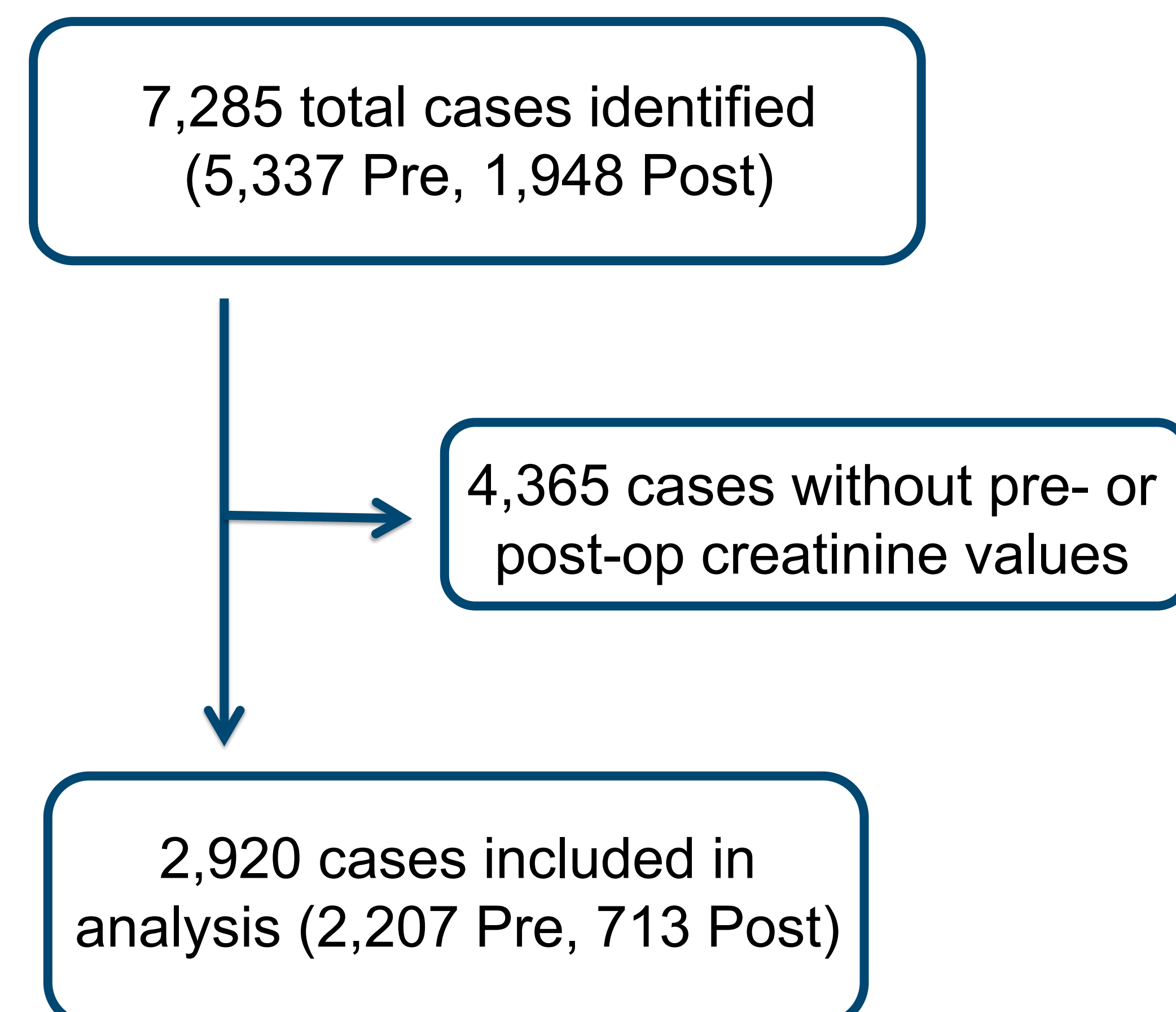
The purpose of this study was to evaluate postoperative outcomes of surgery patients with procedures performed before and after the implementation of statewide IVF sparing protocols instituted in response to supply constraints caused by Hurricane Helene.

METHODS

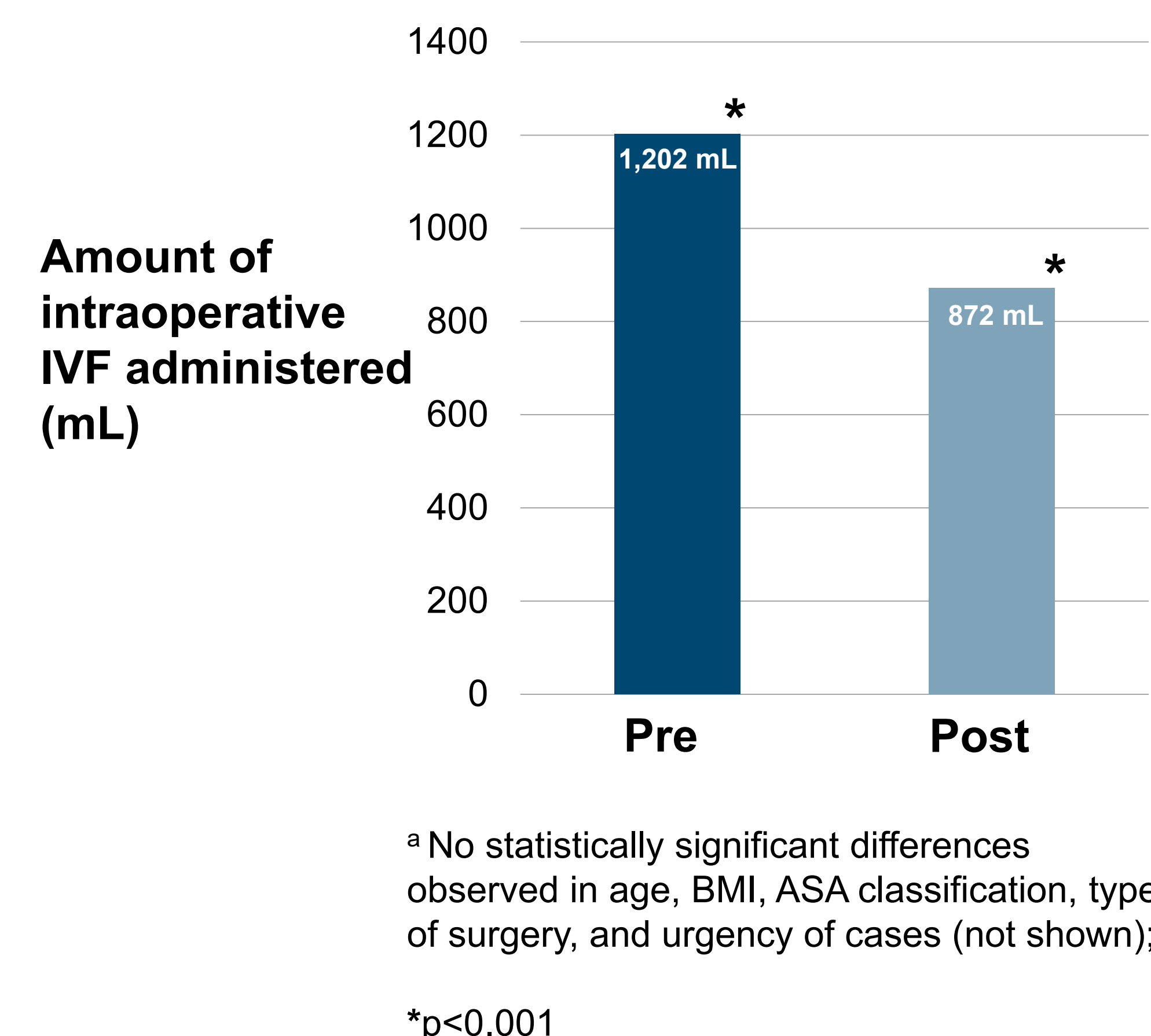
Patients undergoing general surgery procedures at South Carolina Surgical Quality Collaborative hospitals between 10/2023-2/2025 were abstracted and analyzed.⁴ Cases before the IVF supply disruption (Pre) were compared to those after (Post). Baseline characteristics and demographics were compared between groups to assure similar distribution comorbidities, type of surgery, or urgency of cases. Primary outcome was two-fold or greater postoperative creatinine increase (AKI). Secondary outcomes included adjusted length of stay, morbidity and mortality.

RESULTS

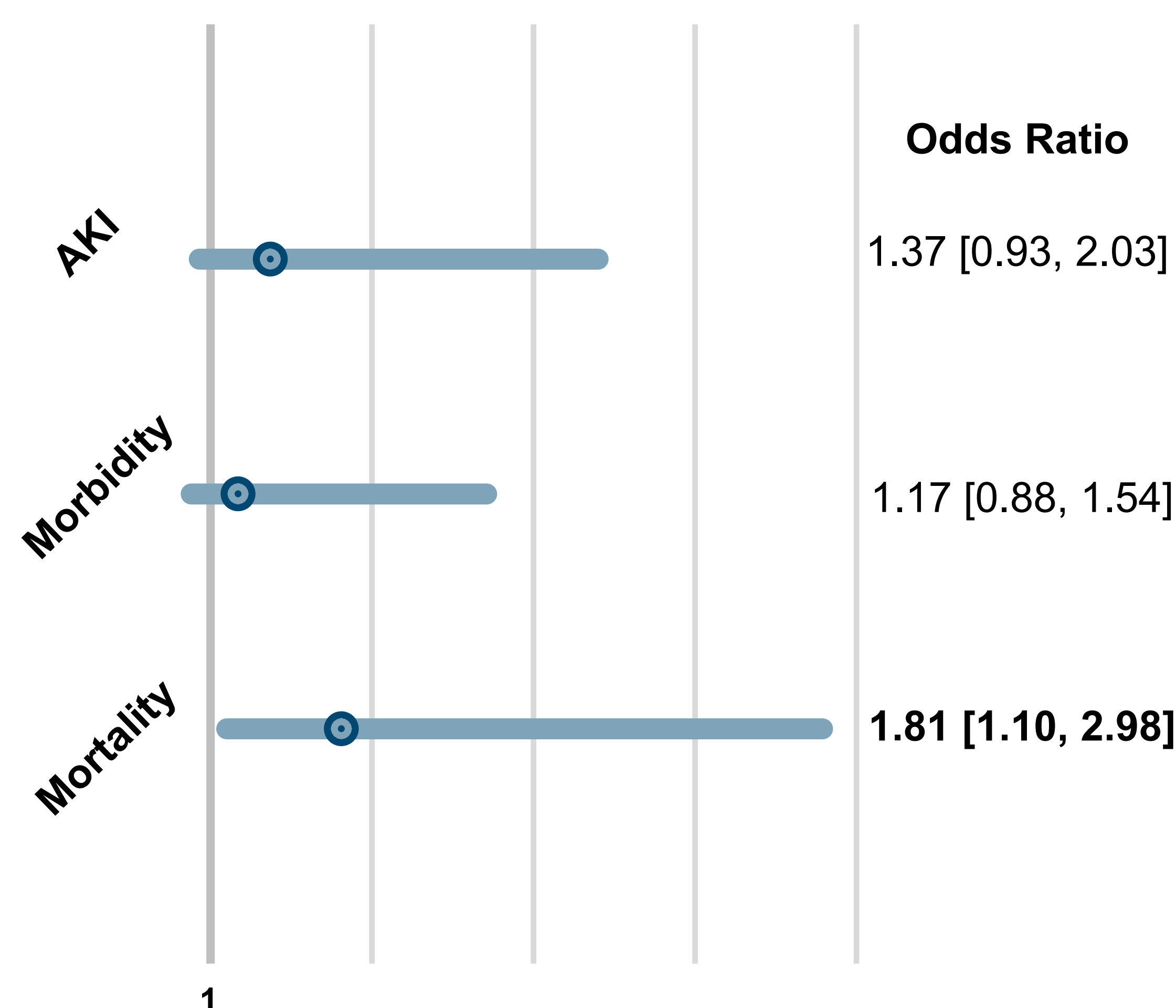
1. Patient selection



2. IVF fluid administration (Pre vs. Post)^a



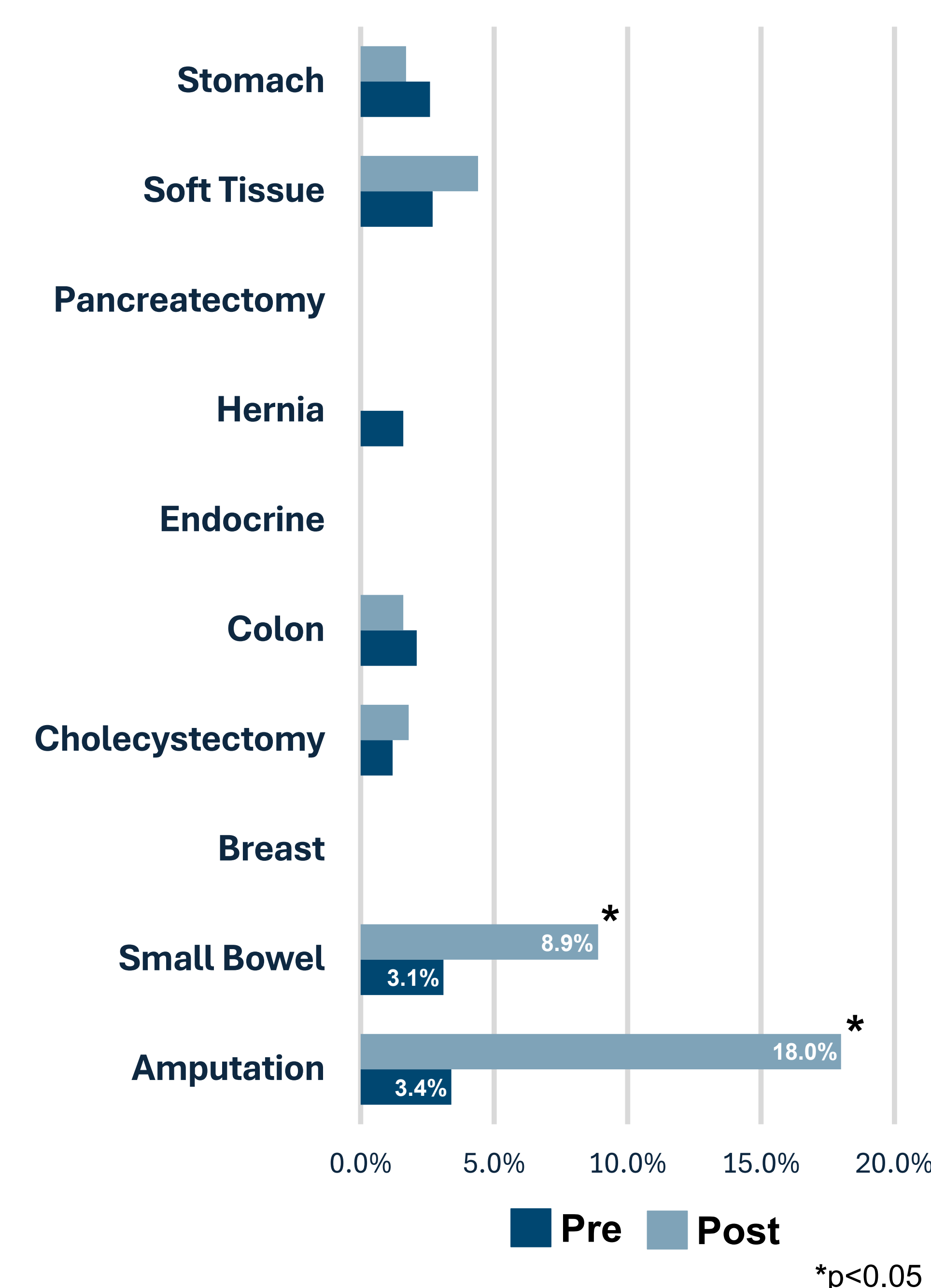
3. Post-operative Outcomes(Pre vs. Post)



Observed rates of AKI (Pre vs. Post)

4.0% vs. 5.3%; p=0.14

4. Mortality Stratified by Case Type



CONCLUSION

In the setting of an intravenous fluid supply shock, intraoperative IVF utilization decreased across a state quality collaborative. There were no observed differences in acute kidney injury, morbidity, or length of stay when comparing cases performed prior to the shortage with cases performed after. Mortality increased in amputation cases and small bowel cases while other case types showed no difference. An IVF sparing approach may be safe in well selected patients. Further randomized controlled trials on individual case types and specific patient populations are needed to further explore effects on intraoperative fluid administration on clinical outcomes.

SUMMARY

Following the Hurricane Helene-related IVF shortage, South Carolina Surgical Quality Collaborative hospitals reduced intraoperative fluid usage by 28%. Analysis of 2,920 general surgery cases Pre and Post implementation of IVF sparing protocols demonstrated no difference in postoperative acute kidney injury, morbidity, or length of stay. Overall mortality increased –driven by small bowel and amputation cases.

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