ACE Inhibitors and ARBs in Perioperative Period
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INTRODUCTION

- ACE inhibitors and Angiotensin Receptor Blockers (ACE, ARBs) are among the most common drugs prescribed.
- Their mechanism of action is by inhibition of vasoconstriction mediated by Angiotensin II, of glomerular efferent arteriole. This physiological response helps the kidney to maintain Glomerular Filtration Rate (GFR) in hypovolemic states.
- Surgery and anesthesia changes the renal blood flow and if patients are on these drugs, it may have an effect on renal function. Hence, we evaluated the relation between the perioperative use of these medications and renal function.

METHODS

- In a retrospective analysis, we evaluated 607 patients who underwent a surgery from January 2008 to November 2010.
- The types of surgeries included cardiac, orthopedic and general. They were all elective surgeries and admitted on the day of surgery and stayed for minimum of two days in order for us to see the follow up laboratory studies.
- These patients were asked to take their routine medications on the morning of surgery. AKI was defined as an increase in creatinine of 0.3 mg/dl and above.
- Fisher’s exact test was used to analyze a 2 by 2 contingency table and a p value of 0.05 was obtained which is statistically significant

RESULTS

- Out of the 607 patients 192 were on ACE/ARBs and 415 were not.
- 125 (20.6%) out of 607 patients developed AKI.
- Of 192 patients on the ACE/ARBs, 49 developed AKI (25.5%).
- Of 415 patients who were not on ACE/ARBs, 76 developed AKI (18.3%).
- The patients were further divided based on sex, race, cardiac or non cardiac surgeries. Based on these divisions, there were 268 males and 339 females. 67 (25%) males had AKI. 84 males were on ACE/ARB and 25 (29.8%) had AKI.
- 58 (17.1%) of females had AKI and 24 (22.2%) out of 108 females on ACE/ARB had AKI.
- 116 were African Americans and 29 (25%) had AKI and 10 (28.6%) out of 35 on ACE/ARB had AKI.
- There were 491 white/Hispanic patients. 95 (19.3%) had AKI. 39 (24.7%) out of 158 on ACE/ARB had AKI.
- Out of 544 patients who underwent non cardiac surgeries, 95 (17.5%) had AKI. 41 (25.1%) out of 171 on ACE/ARB had AKI from this group.
- 63 patients underwent CABG and 30 (47.6%) had AKI. 6 (28.6%) out of 21 who were on ACE/ARB in this group had AKI.

CONCLUSION

- ACE inhibitors and ARBs seem to have higher incidence of AKI when used in preoperative state.
- We may consider holding them in the perioperative period to avoid potential harm. Since the half life of these drugs are less than 24 hours, holding them a day prior to surgery or just the morning dose on the day of surgery should be enough to avoid the adverse effects on the kidney.
- Furthermore, males, African Americans and patients undergoing cardiac surgery seem to have higher incidence of AKI post surgery while on ACE/ARB.

REFERENCES