

BRINGING CLINICIANS TOGETHER TO DISCUSS CURRENT DRUG THERAPY

February 2019 • Vol. 16, No. 2

The following succinct analysis appeared in *Pharmacist's Letter*. Based on vol. 35, No. 2

NEPHROLOGY

You're in a key spot to identify if patients should restart an ACEI or ARB after acute kidney injury...formerly called acute renal failure.

Up to one in 14 hospitalized patients have this rapid decline in kidney function. If they're on an ACEI or ARB, it's often held on discharge...due to concerns of further kidney damage or high potassium.

A common scenario that leads to kidney injury is when patients on an ACEI or ARB start an NSAID, diuretic, or become dehydrated.

Now evidence suggests using an ACEI or ARB after acute kidney injury is linked to lower mortality...but still at the cost of hyperkalemia.

Watch for patients on an ACEI or ARB who stop it after a hospital discharge...or aren't picking up refills...and dig deeper to find out why.

If it was stopped because of acute kidney injury, weigh benefits and risks to help decide about restarting.

For example, don't generally recommend restarting an ACEI or ARB just for hypertension...the risks likely outweigh benefits in this case.

On the other hand, advise restarting an ACEI or ARB when they're known to improve outcomes...such as for patients with heart failure with reduced ejection fraction, recent heart attack, or chronic kidney disease.

Alert prescribers to these patients. Suggest waiting until serum creatinine (SCr) stabilizes to restart...which may take up to 6 weeks.

Recommend restarting at a low dose...such as lisinopril 5 mg/day or losartan 25 mg/day. Advise checking SCr and potassium after one to 2 weeks...and titrating up if labs continue to stay stable.

Suggest halving the dose if SCr bumps up more than 30%. But expect the ACEI or ARB to be held if SCr is still high at the next check...or for potassium 5.5 mEq/L or above. Advise trying to restart when labs improve.

When patients are stable on target doses, recommend checking labs once or twice a year...or up to every 3 months in higher-risk patients.

Advise monitoring more frequently if patients start other meds that raise potassium...spironolactone, TMP/SMX, etc.

Encourage patients to stay hydrated and avoid NSAIDs, especially chronically. And educate to avoid salt substitutes...since these contain potassium.

Check out our algorithm, *Using an ACEI or ARB After Acute Kidney Injury*, for more help with specific clinical scenarios.

(For more on this topic, see Clinical Resource #350208 at PharmacistsLetter.com.)

Primary Reference – Brar S, Ye F, James MT, et al. Association of angiotensin-converting enzyme inhibitor or angiotensin receptor blocker use with outcomes after acute kidney injury. *JAMA Intern Med* 2018;178:1681-90.

See LEADER NOTES for answers to discussion questions.

DISCUSSION QUESTIONS

OVERVIEW OF CURRENT THERAPY

1. **What is known about acute kidney injury (AKI) and the benefits and risks of ACEIs or ARBs?**

ANALYSIS OF NEW STUDY

2. **What type of study was this? How were the patients selected for inclusion?**

3. **How were the study groups defined?**

4. **How were the outcomes evaluated?**

5. **What were the outcomes of the cohort study?**

See [LEADER NOTES](#) for answers to discussion questions.

6. What were the strengths and weaknesses of the cohort study?

7. Were the results expressed in terms we care about and can use?

HOW SHOULD THE NEW FINDINGS CHANGE CURRENT THERAPY?

8. Do the results change your practice? How?

APPLY THE NEW FINDINGS TO THE FOLLOWING CASE

GH is a 56-year-old male with a past medical history of diabetes, hypertension, and CKD. He's seeing you today for a one month follow-up appointment after starting an SGLT2 inhibitor for his diabetes. His home medications include atorvastatin 80 mg daily, chlorthalidone 25 mg daily, empagliflozin 25 mg daily, lisinopril 40 mg daily, metformin 1 g twice daily. You note that his BP is well-controlled today at 117/62 but his heart rate is slightly elevated at 97. He states that his blood sugars have been controlled better since starting empagliflozin, with fasting blood sugars ranging from 140-170 mg/dL. He does state that he's noticed more frequent urination since starting the medication and has developed progressive dizziness that is worst in the morning.

9. What are the potential adverse reactions of SGLT2 inhibitors?

See [LEADER NOTES](#) for answers to discussion questions.

You check a basic metabolic panel after the visit and are notified by the lab of a critical creatinine level of 4.6 mg/dL. A review of his lab work reveals a baseline creatinine level of 1.4 mg/dL. You notify GH of the need for hospitalization due to his acute kidney injury.

10. Which of GH's medications should be held upon admission to the hospital?

GH remains hospitalized for three days and his renal function improves with aggressive IV hydration. His creatinine decreases to 2.4 mg/dL by the day of discharge. His blood pressure was elevated during his hospitalization, so he was started on amlodipine 10 mg daily. GH's medications that were held during hospitalization were not restarted on discharge, and GH was instructed to follow-up with his PCP for further management of his blood pressure and diabetes.

GH is seeing you today for follow-up, now two weeks out from his hospitalization. His blood pressure is slightly elevated at 152/88 but he is otherwise feeling well and without any complaints. He has been checking his blood sugar since he arrived home from the hospital and notes that his fasting blood sugars are now typically in the low 200s. His creatinine level is now back to his prior baseline.

11. How should you manage GH's blood pressure and diabetes given his recent episode of AKI?

See [LEADER NOTES](#) for answers to discussion questions.

REFERENCES

Bhandari S, Ives N, Brettell EA, et al. Multicentre randomized controlled trial of angiotensin-converting enzyme inhibitor/angiotensin receptor blocker withdrawal in advanced renal disease: the STOP-ACEi trial. *Nephrol Dial Transplant* 2016;31:255-61.

Brar S, Ye F, James MT, et al. Association of angiotensin-converting enzyme inhibitor or angiotensin receptor blocker use with outcomes after acute kidney injury. *JAMA Intern Med* 2018;178:1681-90.

Gayat E, Hollinger A, Cariou A, et al. Impact of angiotensin-converting enzyme inhibitors or receptor blockers on post-ICU discharge outcome in patients with acute kidney injury. *Intensive Care Med* 2018 May 15. doi: 10.1007/s00134-018-5160-6.

Kellum JA, Lameire N; KDIGO AKI Guideline Work Group. Diagnosis, evaluation, and management of acute kidney injury: a KDIGO summary (Part 1). *Crit Care* 2013;17:204.

Levey AS, James MT. Acute kidney injury. *Ann Intern Med* 2017;167:ITC66-ITC80.

Rahman M, Shad F, Smith MC. Acute kidney injury: a guide to diagnosis and management. *Am Fam Physician* 2012;86:631-9.

Additional Pharmacist's Letter Resources available at PharmacistsLetter.com

Algorithm, Using an ACEI or ARB After Acute Kidney Injury. *Pharmacist's Letter/Prescriber's Letter*. February 2019.

Chart, Comparison of Angiotensin Receptor Blockers (ARBs). *Pharmacist's Letter/Prescriber's Letter*. September 2018.

Chart, Management of Albuminuria: Focus on Pharmacotherapy. *Pharmacist's Letter/Prescriber's Letter*. September 2018.

Commentary, Chronic Kidney Disease Checklist. *Pharmacist's Letter/Prescriber's Letter*. August 2018.

Toolbox, Improving Heart Failure Care. *Pharmacist's Letter/Prescriber's Letter*. August 2018.

Chart, Heart Failure Treatment at a Glance. *Pharmacist's Letter/Prescriber's Letter*. August 2018.

Toolbox, Optimizing Care of Patients with Coronary Artery Disease. *Pharmacist's Letter/Prescriber's Letter*. February 2018.

Chart, Target Doses of Meds for Systolic Heart Failure. *Pharmacist's Letter/Prescriber's Letter*. December 2017.

Chart, ACEI, ARB, and Aliskiren Comparison. *Pharmacist's Letter/Prescriber's Letter*. February 2016.

PL Journal Club Editors:

Lori Dickerson, PharmD, FCCP, Editor; Jennifer Nieman, PharmD, BCPS, Associate Editor; Lisa D. Mims, MD, Department of Family Medicine, Medical Univ of South Carolina, Charleston, SC; Heather A. Pace, PharmD, Drug Information Center, Univ of Missouri, Kansas City, MO; Maribeth Porter, MD, Department of Community Health and Family Medicine, Univ of Florida, Gainesville, FL, Contributing Editors.

DISCLOSURE:

The editors of this activity and its publisher, Therapeutic Research Center (TRC), have no relevant financial interests related to the products or services covered by this activity. TRC does not receive any commercial support and does not accept any advertising. It is completely independent and is supported entirely by subscriptions. TRC focuses on delivering completely objective, unbiased drug information and advice for the benefit of subscribers.

See **LEADER NOTES** for answers to discussion questions.