

# Preprocedure Glucose Linked to Kidney Injury

BY KATE JOHNSON

FROM THE JOURNAL OF THE AMERICAN COLLEGE OF CARDIOLOGY

**H**yperglycemia after myocardial infarction is a red flag for nondiabetic patients about to undergo coronary angiography because it is a risk factor for contrast-induced acute kidney injury, according to a large, retrospective analysis study.

"Hyperglycemic patients without known diabetes should be recognized as a high-risk group for CI-AKI [contrast-induced acute kidney injury] and should be considered for prophylactic measures similar to those used in other high-risk patients," wrote Dr. Joshua M. Stolker of the Mid American Heart Institute of Saint Luke's Hospital, Kansas City, Mo., and colleagues (*J. Am. Coll. Cardiol.* 2010;55:1433-40).

The study is the first to document an increasing risk of CI-AKI with progressive

**In nondiabetic MI patients undergoing angioplasty, the risk for contrast-induced acute kidney injury rose along with increasing glucose levels.**

blood glucose elevations in patients who do not have diabetes, Dr. Martin A. Alpert and Dr. Carl Carlino of the division of cardiovascular medicine, University of Missouri, Columbia, noted in an editorial (*J. Am. Coll. Cardiol.* 2010;55:1441-3). "Hyperglycemia ... occurs in more than 40% of patients without diabetes with acute myocardial infarction. In the critical care population, hyperglycemia in patients without diabetes is seen by some as a 'stress test' denoting the failure of endogenous insulin reserves to adequately control blood glucose."

The study analyzed 6,358 consecutive patients from the Health Facts database who underwent coronary angiography after acute MI. Of them, 1,929 (30%) had known diabetes. Preprocedural hyperglycemia (blood glucose at least 140 mg/dL) was present in 42% of the entire cohort, of whom 48% were nondiabetic. All patients were stratified according to their preprocedural blood glucose level: less than 110 mg/dL; 110 to less than 140 mg/dL; 140 to less than 170 mg/dL; 170 to less than 200 mg/dL; and 200 mg/dL or more.

After coronary angiography, 823 patients (13%) developed CI-AKI (an absolute serum creatinine increase of 0.3 mg/dL or more, or a relative increase in serum creatinine of 50% or more within 48 hours of the procedure), the primary study end point. After adjustment for confounders, there was a strong association between preprocedural glucose levels and CI-AKI risk in patients without diabetes, but not in patients with established diabetes—regardless of their glucose levels, reported the authors.

Among the nondiabetic patients, the

risk for CI-AKI increased with increasing glucose levels. Compared with patients with blood glucose levels below 100 mg/dL (reference), those in the higher glucose categories had increasingly higher risks for CI-AKI, with odds ratios of 1.31, 1.51, 1.58, and 2.14, all significant differences. This pattern was not seen in diabetic patients (OR 0.71, 0.82, 0.73, 0.94).

Nondiabetic, hyperglycemic acute MI

patients may receive less aggressive glucose control than their diabetic counterparts, and may also receive less aggressive CI-AKI prophylaxis, the authors said. Additionally, some hyperglycemic patients may have undiagnosed and untreated diabetes, putting them at higher risk. Also, nondiabetic patients who become hyperglycemic may be experiencing more severe illness compared with diabetes patients who become hyperglycemic.

The results identify a new risk marker and "raise the question of whether interventions such as intensive insulin therapy might reduce risk in this population," noted the editorialists.

The American Heart Association funded the research. Dr. Stolker has financial ties with AstraZeneca Pharmaceuticals, Pfizer Pharmaceuticals, and Novo Nordisk, and Educational Testing Consultants LLC. ■

**NOW RECOMMENDED**  
as a treatment choice in  
**ACC/AHA STEMI Guidelines**  
and **ACC/AHA/SCAI PCI Guidelines**<sup>1,2</sup>

 **Effient**  
(prasugrel) tablets

## INDICATIONS AND USAGE

Effient is indicated to reduce the rate of thrombotic cardiovascular (CV) events (including stent thrombosis) in patients with acute coronary syndrome (ACS) who are to be managed with percutaneous coronary intervention (PCI) as follows:

- Patients with unstable angina (UA) or non-ST-elevation myocardial infarction (NSTEMI)
- Patients with ST-elevation myocardial infarction (STEMI) when managed with primary or delayed PCI

## IMPORTANT SAFETY INFORMATION

### WARNING: BLEEDING RISK

Effient® (prasugrel) can cause significant, sometimes fatal, bleeding. Do not use Effient in patients with active pathological bleeding or a history of transient ischemic attack or stroke. In patients ≥75 years of age, Effient is generally not recommended, because of the increased risk of fatal and intracranial bleeding and uncertain benefit, except in high-risk situations (patients with diabetes or a history of prior MI) where its effect appears to be greater and its use may be considered. Do not start Effient in patients likely to undergo urgent coronary artery bypass graft surgery (CABG). When possible, discontinue Effient at least 7 days prior to any surgery. Additional risk factors for bleeding include: body weight <60 kg, propensity to bleed, concomitant use of medications that increase the risk of bleeding (eg, warfarin, heparin, fibrinolytic therapy, chronic use of nonsteroidal anti-inflammatory drugs [NSAIDs]). Suspect bleeding in any patient who is hypotensive and has recently undergone coronary angiography, percutaneous coronary intervention (PCI), CABG, or other surgical procedures in the setting of Effient. If possible, manage bleeding without discontinuing Effient. Discontinuing Effient, particularly in the first few weeks after acute coronary syndrome, increases the risk of subsequent cardiovascular events.

- Effient is contraindicated in patients with active pathological bleeding, such as from a peptic ulcer or intracranial hemorrhage (ICH), or a history of transient ischemic attack (TIA) or stroke
- Patients who experience a stroke or TIA while on Effient generally should have therapy discontinued. Effient should also be discontinued for active bleeding and elective surgery
- Premature discontinuation of Effient increases risk of stent thrombosis, myocardial infarction (MI), and death
- Thrombotic thrombocytopenic purpura (TTP), a rare but serious condition that can be fatal, has been reported with the use of other thienopyridines, sometimes after a brief exposure (<2 weeks), and requires urgent treatment, including plasmapheresis

Please see Brief Summary of Prescribing Information on adjacent pages.

For more information about Effient® (prasugrel), call 1-866-EFFIENT or visit Effient.com.

References: 1. Kushner FG, Hand M, Smith SC Jr, et al. *Circulation.* 2009;120:2271-2306. 2. Kushner FG, Hand M, Smith SC Jr, et al. *J Am Coll Cardiol.* 2009;54:2205-2241.



©Effient and the Effient logo are registered trademarks of Eli Lilly and Company.

Copyright © 2010 Daiichi Sankyo, Inc. and Lilly USA, LLC. All Rights Reserved. PG63968. Printed in USA. April 2010.