

Renal Insufficiency and ACE Inhibitor Use

Frances CD, Noguchi H, Massie BM, et al. Are we inhibited? Renal insufficiency should not preclude the use of ACE inhibitors for patients with myocardial infarction and depressed left ventricular function. *Arch Intern Med* 2000;160:2645–50.

Study Overview

Objective. To determine if patients with depressed left ventricular function following acute myocardial infarction (MI) show a similar reduction in mortality from angiotensin-converting enzyme (ACE) inhibitor use, regardless of renal function.

Design. Retrospective cohort study using medical records data.

Setting and participants. 20,902 Medicare beneficiaries aged 65 years and older who were directly admitted to nonfederal hospitals between 1 February 1994 and 30 July 1995 and who had a left ventricular ejection fraction of less than 40% as documented either by angiogram, echocardiogram, or radionuclide scintigraphy following a confirmed acute MI.

Main outcome measure. 1-year survival stratified by level of renal function.

Main results. 30% of patients with poor renal function (serum creatinine > 3 mg/dL) and 60% with better renal function (serum creatinine < 3 mg/dL) were treated with an ACE inhibitor. The greatest survival benefit was seen in patients with poor renal function who received an ACE inhibitor on hospital discharge; these subjects had a 37% lower mortality than similar patients who did not receive the drug. Further, ACE inhibitor use was associated with a 16% lower mortality in patients with better renal function. Concurrent aspirin use reduced the beneficial effect of ACE inhibitors on 1-year survival both in patients with poor renal function (hazard ratio, 1.46 [95% confidence interval (CI), 1.01 to 2.10]) and in those with better renal function (hazard ratio, 1.05 [95% CI, 0.94 to 1.18]). Use of β blockers, percutaneous angioplasty, coronary artery bypass, and higher left ventricular function were associated with increased 1-year survival, while advanced age, female sex, comorbidities (eg, diabetes, dementia, perivascular disease), congestive heart

failure, and conduction disturbance were associated with decreased survival.

Conclusion

Moderate renal insufficiency should not be considered a contraindication for ACE inhibitor use in patients with depressed left ventricular function following MI. Aspirin may decrease the benefits of ACE inhibitors in these patients.

Commentary

This study by Frances et al is one of the first to look at ACE inhibitor use in MI patients with both impaired renal function and depressed left ventricular function. American College of Cardiology (ACC) guidelines recommend ACE inhibitor therapy for patients with acute MI and a left ventricular ejection fraction of less than 40%; however, the guidelines advise against this treatment in cases of clinically relevant renal failure (no specific serum creatinine values are given) [1]. Large, randomized studies that have examined ACE inhibitor efficacy in post-MI patients with depressed left ventricular function did not include patients whose creatinine values were greater than 2 mg/dL [2–4]. Notably, Frances and colleagues found that 40% of study patients did not receive ACE inhibitors despite having good renal function. These numbers correlate with recent data [5], and older studies showed similar results [6]. The authors also observed an underuse of aspirin and β blockers; on average, 63% of patients were taking aspirin in the good renal function group and only 25% to 30% of all patients were taking β blockers on discharge.

Frances et al's study has a few shortcomings. First, it is an observational study, and some confounding variables may not have been accounted for. Investigators did not consider the possibility that some patients may have had a prior history of ACE inhibitor use and may have stopped due to side effects, nor did the researchers measure ACE inhibitor treatment after hospital discharge. Further, the data examined by Frances and colleagues were 5 years old and may not reflect recent changes in ACE inhibitor prescription rates. The authors excluded patients who died during the hospital stay;

it would be interesting to know if any of these deaths were related to ACE inhibitor use.

Applications for Clinical Practice

This study underscores the need for broader use of ACE inhibitors. These agents are underused in MI patients who have depressed left ventricular function and provide a benefit even in patients with moderate renal impairment. As aspirin may cancel the protective effect of ACE inhibitors in these patients, a different antiplatelet agent, such as clopidogrel bisulfate, should probably be used instead.

References

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