Kidney Failure and Cardiovascular Disease

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Analyses from a large clinical trial show that the medical community has only recently appreciated the increased risk of heart disease across the spectrum of renal disease.[1] Chronic kidney disease is present in far more people than is commonly recognized, including those over 60 years of age with serum creatinine values over 1.2 mg/dL.[2] Moreover, the presence of chronic kidney disease is an independent risk factor for the development of heart disease.[3] Presence of kidney disease is enough to classify such individuals in the same category of risk for death from a cardiovascular event as those with diabetes or prior heart disease. This notion is becoming more important because recent studies have estimated that 11% of the US population, or almost 12 million people, have chronic kidney disease.[4]

What is disturbingly clear, however, is that certain therapies that greatly reduce the risk of heart disease in patients with chronic kidney disease are much less likely to be used when chronic kidney disease is present than when patients experience normal renal function (Figure). These data suggest that healthcare providers are reluctant to use standard therapies after a heart attack in patients who have chronic kidney disease. Although the best way to screen for heart disease in patients with chronic kidney disease is controversial, the "gold standard" requires x-ray studies where an injection of a "dye" is given into the arteries or veins. This is a controversial and rapidly changing area and could be a separate topic in itself. Therefore, we will focus on prevention and treatment of heart disease in patients with chronic kidney disease.

The apparent reluctance of healthcare providers to use aspirin in chronic kidney disease patients with heart disease is difficult to explain. Healthcare providers consider the presence of chronic kidney disease a reason not to use aspirin in patients with heart disease. Although there has been concern that patients with chronic kidney disease may have poorly functioning platelets (cells that help blood clot), which leads to an increased bleeding risk, in the modern era, dialysis patients actually have a much greater risk of life-threatening blood clots than the general population. In addition, other studies demonstrate that standard therapies such as aspirin and beta-blocking drugs such as metoprolol, atenolol, and carvedilol are associated with reduced risk of death after heart attack, even in patients with chronic kidney disease. Angiotensin-converting enzyme (ACE) inhibitors, such as lisinopril, ramipril, enalapril, and others, are well-tolerated in clinical trials of patients with chronic kidney disease and reduce risk of death after heart attack in patients with kidney disease.[2] Angiotensin receptor blockers (ARBs), such as losartan, valsartan, irbesartan, and others, also slow the progression of kidney disease and lower the occurrence of heart failure in patients with type 2 diabetes when used with diuretics.

Potentially dangerous elevations in serum potassium levels have occurred in dialysis patients taking ACE inhibitors. However, the risk of hyperkalemia (dangerously high levels of potassium that might lead to sudden death) is slightly lower in such patients treated with ARBs than in those treated with ACE inhibitors. Moreover, diuretics such as furosemide used twice daily or high-dose long-acting diuretics such as chlorthalidone should be given to these patients. This will clearly reduce the risk of developing hyperkalemia. Additionally, curtailing or avoiding nonsteroidal antiinflammatory agents such as ibuprofen, naproxen, and the like, as well as salt substitutes, will retard hyperkalemia development.

No studies have tested the effects of lipid-lowering agents ("statins" such as atorvastatin, simvastatin, and oth-

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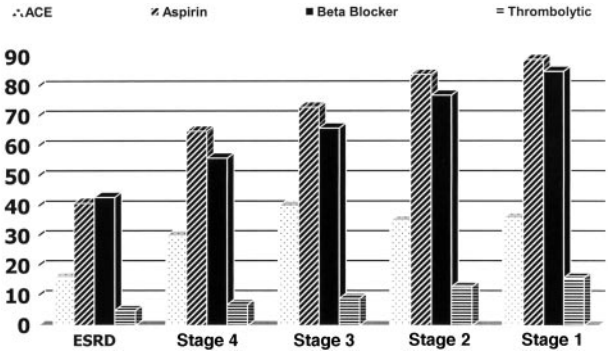

Use of medications helpful to reduce risk of cardiovascular disease according to the severity of kidney disease. Note that there is significantly less use of aspirin, beta-blockers, angiotensin-converting enzyme inhibitors as the level of kidney function decreases, even though risk for cardiovascular events increases. ESRD indicates end-stage kidney disease (people on dialysis). Data derived from Wright RS, Reeder GS, Herzog CA, et al. Acute myocardial infarction and renal dysfunction: a high-risk combination. *Ann Intern Med*. 2002;137:563–570.

ers) on either cardiovascular events or mortality in patients with chronic kidney disease. Unfortunately, recent experience with cerivastatin has colored the perceptions of many providers who might have prescribed statins for patients with chronic kidney disease. However, agents such as simvastatin and pravastatin have an excellent safety record and effectively lower lipid levels in patients with chronic kidney disease. They may improve survival despite their current low level of use.

In summary, patients with abnormal kidney function are at a greatly increased risk of heart disease and subsequent death from cardiovascular causes. Despite this, the recommended methods of both preventing and treating heart disease are greatly underutilized in patients with kidney disease. Until this is rectified, improvement in the diagnosis of heart disease in patients with chronic kidney disease may not lead to improved health outcomes. It is important for members of the medical community as well as patients to realize that lipid-lowering drugs and other cardioprotective medications should be used, not avoided, in patients with chronic kidney disease to reduce the risk of subsequent heart disease that will definitely occur if such medications are not used. Patients with chronic kidney disease need to be aware of this so that they can make the most informed choices about their health.

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Additional Resources

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