Indicators for Cardiovascular Catastrophe in Diabetic Patients with Renal Failure

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Cardiovascular catastrophes are the most common cause of death in dialyzed patients and account for 50% of all patient deaths. Although there has been no change in relative death rate from cardiovascular diseases in hemodialyzed patients, there has been an astounding absolute decrease, particularly early in the first-year mortality, from 50% to 14% over the last decade.\(^1\)^\(^2\) This has occurred in spite of the marked rise in the age of patients when accepted into dialysis in spite of the fact that more patients with serious systemic diseases are now treated.\(^2\) Actually, recent papers question whether there is still an increased incidence of cardiovascular deaths.\(^3\)^\(^4\)

In diabetic patients, the absolute death rate is at least two or three times that of nondiabetic patients on dialysis, and the relative cardiovascular death rate is even higher, being close to 70% of all deaths.\(^5\) Also, cardiovascular deaths are many times more common in transplanted diabetic patients than in transplanted nondiabetic patients.\(^6\)^\(^7\) Beyond the first posttransplant year, cardiovascular deaths are more common than septic deaths in diabetic transplanted patients.\(^8\) It is obviously of great importance to identify any clinical markers predicting cardiovascular catastrophes in such patients. It is a waste of resources to start dialysis or transplant a patient who dies soon thereafter. It also prolongs the patient’s agony and dashes the hopes of the patient’s family. The following methods have been evaluated in predicting cardiovascular deaths in patients on dialysis and following transplantation: (1) history of angina, congestive heart failure, or myocardial infarct, (2) electrocardiogram (EKG), (3) stress EKG, (4) blood lipid levels, (5) angiography, and (6) stress EKG, plus before and after \(^{201}\)TI imaging.

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1. **History of Heart Disease**

The most thorough evaluation of the predictive value of a history of heart disease in diabetic patients has been performed by Comty and co-workers.\(^9\) Table 1 summarizes their findings. Evaluating more than 100 diabetic patients starting chronic dialysis, they had an overall first-year mortality rate of 43% in patients started before 1972 versus 17% of those started thereafter. Before 1972, a patient with a history of angina or myocardial infarct had twice the death rate, but after 1972 there was no difference in mortality. Their findings suggest that technologic advances modify predictive factors. Indirect evidence that preexisting cardiac arteriosclerosis is of predictive value of the survival of nondiabetic patients has been presented by Blagg.\(^10\) The 1-year death rate in patients with a diagnosis other than nephrosclerosis was less than 10%, whereas in patients with nephrosclerosis it approached 50%. Three-year survival rates were 80% and 40%, respectively. On the other hand, a history of heart disease was not a bad prognostic marker in patients started on dialysis according to a report summarizing the overall United States experience since 1975. The 3-year survival in patients with heart disease was 70%, the same as in all dialysis patients.\(^11\) The impact of a history of heart disease on the prognosis of dialyzed patients is thus contradictory but appears to be of little importance. No analysis of the prognosis of transplant survival relative to a history of heart disease has been reported.

2. **EKG or EKG Combined with History**

When Comty and co-workers combined a history of angina or myocardial infarct with grossly abnormal EKG, they found an increase in death rate of diabetic patients started on dialysis (Table 1). Thus, the death rates in patients with such findings were 56% and 40% versus 43% and 27%, respectively, before and after 1972.\(^9\) In 132 transplanted diabetic patients, we evaluated the prognostic importance of grossly abnormal EKG and/or a history of angina. Sixty-eight patients had evidence of heart disease by these criteria. Two had had fatal myocardial infarcts and three nonfatal myocardial infarcts for an overall incidence of five (7.4%). In patients without such markers (64 patients), four had fatal myocardial infarcts and five had nonfatal myocardial infarcts for an overall incidence of nine (14%). Obviously, there is no