HEART OF THE MATTER

Heart and Kidney Transplantation

The comorbidity of heart failure and kidney failure poses a therapeutic dilemma for both cardiologists and nephrologists and has become a more important problem in managing an aging population. Many of the drugs used to treat heart failure have adverse effects on renal function, and chronic heart failure patients poorly tolerate chronic dialysis.

The development of left ventricular assist devices (LVADs) has expanded the therapeutic options available for the treatment of advanced heart failure, but their use has resulted in many LVAD patients experiencing progressive renal failure. As a result, more patients are going on to combined LVAD and dialysis (LVAD-D) therapy and becoming candidates for combined heart and kidney transplantation (HKT). The creation of this new chronic cardiorenal population poses important logistic and societal challenges.

BY SIDNEY GOLDSTEIN, M.D.

There is very little information available to estimate the benefit of chronic device support or HKT, but the potential issues associated with outcome in patients with chronic left ventricular dysfunction speak to the need to consider the potential benefit of this class of therapy. Chronic renal dysfunction is a well-recognized comorbidity in heart failure patients, but until the development of LVADs, heart transplantation was an unlikely outcome. In a survey of almost 20,000 heart transplant recipients reported in the United Network for Organ Sharing database prior to December 2005, only 1.4% received both a heart and a kidney transplant (Arch. Surg. 2009;144:241-6). This was mainly because advanced renal disease has been an exclusion criteria for heart transplantation alone.

The wider application of LVADs as chronic destinations therapy and as a bridge to transplantation has made combined LVAD-D a hitherto ignored option for heart failure patients. In some cases this dual support is a planned therapeutic course. In others, it has become a matter of salvage, when renal failure occurs as a complication of LVAD implantation necessitating acute and chronic dialysis.

According to the UNOS report, prior to 2005, that is, before the wider use of LVADs, 12% of patients receiving HKT were on an LVAD at the time of HKT and 56% were on chronic dialysis. The authors developed a risk score, driven largely by the presence of peripheral vascular disease, age, the use of renal dialysis, and the need for LVAD support. The 1-year survival rate in the 274 patients receiving HKT varied from 93% in the low-risk group to 62% in the high-risk group. The 1-year risk in the high-risk group was four times that of the low-risk group.

HKT can be performed simultaneously or sequentially. Small series from simultaneous single institutions reported an operative mortality of 21% with a 5-year survival of 66% (Am. J. Transpl. 2001;1:89-92).

The benefit of this dual approach to heart failure therapy must be compared to the benefit of each organ transplantation alone. Survival benefit for heart-alone and kidney-alone transplantation now exceeds 10 years. Of concern however is the 3.8% annual mortality rate, a threefold increase since 1995, of HT patients waiting for a kidney transplant.

The relative paucity of both kidney and heart donors demands that the mortality for dual therapy must be measured against that standard. But multi-organ transplantation deprives one needy patient from a precious organ and does little to expand the availability of organ transplantation to a larger population. Nevertheless, the comorbidity of heart failure and renal failure remains a major issue in the management of the chronic heart failure patient and almost certainly will lead to a greater use of LVAD-D and HKT. ■

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Correction

The design of the PARTNER trial was misstated in "'Top Ten' Forecast for Interventional Cardiology" (September 2010, p. 29). The study is comparing transcatheter aortic valve replacement with conventional surgical heart valve replacement.

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