Transplant Infectious Disease: Implications for Critical Care Nurses

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KEYWORDS

- Transplant • Transplant candidates • Transplant recipients
- Organ donors • Ventricular assist devices • Infection
- Infectious disease • Critical care nursing

Solid organ transplantation increases both the length and quality of life for many patients with end-stage organ disease. However, transplantation is not without risk of serious complications, and infection is a major concern in this population. Critical care nurses are frequently involved in the clinical management of potential organ donors, transplant candidates with end-stage organ disease, and transplant recipients. The purpose of this article is to discuss infection in each of these patient populations, particularly with respect to the role of the critical care nurse in preventing, monitoring for, and treating infections.

BACKGROUND

There are several reasons why transplant-related infectious diseases are important to the critical care community. First, there are increasing numbers of immunocompromised patients in the intensive care unit (ICU) because of the improved survival rates of recipients of all types of solid organ transplants (SOTs). As the longevity of transplant recipients increases, these patients are more prone to develop chronic conditions that frequently require ICU stays. Second, the development of novel and more potent immunosuppressive agents has the potential to increase the frequency and severity of posttransplant infections that subsequently necessitate admission to a critical care unit. Lastly, infections in transplant candidates and recipients are a major cause of morbidity, mortality, increased length of hospital stay, and increased costs.[1]

INFECTIONS IN TRANSPLANT CANDIDATES

Transplant candidates are often at increased risk of developing infections due to their end-stage disease processes. These patients frequently require ICU care

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Crit Care Nurs Clin N Am 23 (2011) 519–537
doi:10.1016/j.ccell.2011.08.001 **ccnursing.theclinics.com**
0899-5885/11/$ – see front matter Published by Elsevier Inc.

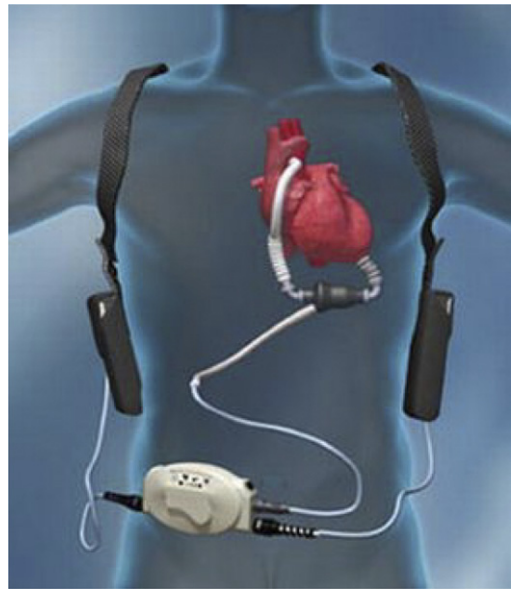

Fig. 1. HeartMate II VAD. (*Reprinted from* Thoratec Corporation; with permission.)

while they are on the transplant waiting list. Urinary tract infections are common in kidney and pancreas transplant candidates. Kidney transplant candidates are also at risk for infections in the native kidneys and occult abscesses. Liver transplant candidates may have intra-abdominal infections or aspiration pneumonia. Pneumonia is also common in the heart and lung candidate populations. Hospitalized candidates are at risk for catheter- or device-related infections, such as those associated with dialysis access devices or ventricular assist devices (VADs).

Patients With VADs

As of August 2011, there were more than 3100 candidates on the heart transplant waiting list in the United States.[2] To date, only 949 heart transplant procedures have been performed in the United States in 2011. Thus the demand for donor hearts far exceeds the supply.[3] VADs were developed to augment circulation in patients with end-stage heart disease. These devices have been approved by the Food and Drug Administration for three purposes: to bridge patients to heart transplantation, to bridge patients to recovery of their native myocardial function, and to provide permanent support for patients who are not deemed to be suitable heart transplant candidates ("life-time" or "destination" therapy).[4]

VADs can support the right or left ventricle or both. They stabilize the patient's condition by increasing cardiac output, improving perfusion to vital organs, and restoring mobility.[5,6] These devices are typically implanted through a median sternotomy incision and placed in a pre-peritoneal or intra-abdominal pocket.

The major components of a VAD are inflow and outflow cannulae, unidirectional valves, a polyurethane chamber (for pulsatile devices), and a pump or rotor. The device is connected to an external power source through a driveline that exits through the abdominal wall (**Fig. 1**).[7,8]