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**Outcomes of Cardiac Transplantation**

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This report is submitted as an assignment in the cardiovascular block.

## **Abstract:**

Cardiac transplantation is the treatment that patients with severe heart failure turn to after unsuccessful medical and device therapy. Patients are listed according to the severity of their illness and the availability of a compatible heart donor. The presence of other diseases, such as pulmonary hypertension or any kidney diseases, could lead to even more consequences. Heart transplantation has shown encouraging results, but long-term complications are still common.

## **Introduction:**

Heart failure is often the final stage in many heart diseases, and considering its fatal course; treatment must be urgent. Medical and device therapy are the obvious choices, but sometime the heart is too damaged to be responsive. In such cases we turn to a gamble that is worth taking: the cardiac transplantation. The annual number of registered heart transplants varies from 3500 to 4500 transplants, with a steady increase in recent years.<sup>1</sup>

In addition to being a highly complicated procedure, a major obstacle in cardiac transplantation is finding a heart in the first place. The heart transplant centres usually create a waiting list; seeing how the number of patients with severe heart failure outweighs the number of heart donors. The number of newly added candidates has increased by 51% since 2004. Factors such as the severity of the illness and the availability of a compatible donor must be taken in consideration.<sup>2</sup>

Deciding who gets the heart also depends on who has the better chances of survival in the postoperative period. A patient who suffers from pulmonary hypertension has an increased risk of developing right heart failure immediately after the transplant. Patients with infection or cancer could get their conditions worsened due to the effects of the immunosuppressive drugs. These drugs can be toxic to the kidney, so any renal insufficiency is viewed as a major setback, some patients may even consider undergoing a heart-kidney transplant.<sup>3</sup>

In the 1980s, the leading cause for which the procedure is performed for adults was the ischemic heart disease -IHD- accounting for nearly 50%. However, in recent years, with the improved therapy for IHD and the usage of mechanical circulatory support; the percentage has decreased to 35%, while cardiomyopathies -CM- have become the leading cause with 59%. The other causes include congenital heart diseases -CHD- (3.2%) and valvular diseases (1%). It should be noted that CHDs account for 45% in paediatric heart transplants, while CMs make up 37%.<sup>2</sup>

The aim of this report is to illustrate the short-term and long-term results of heart transplant.

## **Discussion:**

The annual reports of OPTN (Organ Procurement and Transplantation Network) have showed a steady decrease in the mortality rates over the last twenty years. Death after a six-month period of time has the lowest frequency (9%). One-year deaths (were 20%) have dropped by half since the 90s, while five-year and ten year deaths (were 35% and 55% respectively) have decreased by at least 15%.<sup>2</sup>

The ISHLT (International Society for Heart and Lung Transplantation) reports have indicated that between 1982 and 2013; the heart transplants –in both adults and children– had a one-year survival rate of 82% and a five-year survival rate of 69%, with an improvement seen in recent results as compared with the ones from the 80s and the 90s. It has also shown that older recipients have a decreased chance in survival.

Regarding mortality rates; graft failure appears to be the most common in short-term mortality, causing an estimated 34% of post-transplant deaths in the first thirty days. This percentage decreases with time but still represents 18% in long-term mortality, exceeded only by malignancy at 20%. However, malignancy has a below 10% in the first three years.

Acute rejection is responsible for 8% of deaths in first three years, but the chances become unlikely in later years. The possibility of a fatal infection is as high as 30% in first months; however, these numbers are lowered to 10-15% in the following years.

Another cause of death is multiple organ failure, which accounts for 23% in the first thirty-day mortality. This percentage falls below 5% in the next five years, but it starts rising again as time goes by. And lastly there are cardiac allograft vasculopathy and renal failure, both uncommon in short-term but represent around 10% in the fifteen-year mortality.<sup>4</sup>

A study in twenty-year survivors took place at Stanford University for the heart transplants performed there between 1968 and 2007 (a total of 1446 heart transplants). There has been a significant increase in one-year survival rate from 43% to 90%.

Sixty patients who underwent transplant from 1968 to 1987 survived for at least twenty years. The chance of a rejection-free first year was 14%, while the absence of infection was more likely at 18%.

Of these long-term survivors: 86% had hypertension, 28% suffered renal failure and 10% underwent kidney transplantation. 36% developed malignancy while 43% had cardiac allograft vasculopathy. Eleven of them underwent a second transplant after an average of eleven years. Fifteen of the forty-three paediatric patients became long-term survivors and lived for at least twenty years.<sup>5</sup>

**Conclusion:**

Cardiac transplantation – as complex as it is- has shown good results. Reports show that long-term survival is possible. These developments are the result of improved immunosuppressive drugs. However these drugs have their side effects that contribute in malignancy, infection and renal failure, as seen in the after mentioned studies above.

**References:**

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