# ETHICS ON CARDIAC TRANSPLANTATION

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## 1. SUMMARY

Cardiac transplantation improves the quality and the longevity of life of the patients having end-stage congestive heart failure however due to lack of donors and the ethical issues especially related to the brain death criteria, it seems to be more controversial than even before. Because of the special circumstances needed for the cardiac transplantation, Board of Medicine of the National Academy of Sciences have proposed guidelines suggesting that the cardiac transplantation should be carried out in only those institutions which have well equipped facilities, surgical expertise and of course the specific capabilities to conduct the whole range of scientific observations involved in total study. It is also important to develop the rigid safeguard with respect to the selection of prospective donors and the selection of the prospective recipients as well. Donors should be completely informed about the donation process including the crucial and irreversible bodily damage and imminent death. Likewise recipient should agree to accept the possible risk and the likelihood benefit from the cardiac transplantation. Hence, the continuous research, investigations and the prospective study of the patients have been performing for the enhancement of the Alternative therapies.

## 2. INTRODUCTION OF CARDIAC TRANSPLANTATION

Cardiac transplantation is widely accepted therapy for the treatment of the end stage congestive heart failure in which failing heart is replaced by another heart from a suitable donor. Before doing cardiac transplantation one should be able to have some information about the congestive heart failure.

Overview of congestive heart failure:
Heart is a pump that works together with lungs and pumping is performed in two ways. It pumps deoxygenated blood from the heart to the lungs and then pumps the oxygenated blood out into systemic circulation.

The heart consists of four chambers; upper chambers are called auricles or atria and the lower chambers are called ventricles. The right atrium and ventricle receive deoxygenated blood from the body and pumps the blood to the lungs whereas the left atrium and ventricle receive oxygenated blood back from the lungs and the ventricle pumps blood into the aorta, systemic arteries and through out the body.
Congestive heart failure sounds to be awesome since it sounds like the heart stops working. However it doesn't mean heart just completely stops beating and pumping. Heart failure is because of the tissues of the body are not receiving enough blood and oxygen temporarily. Heart failure may develop after several years or after the heart attack as the pumping action of the heart becomes less powerful and blood does not move

efficiently through the circulatory system. When the left side of the heart starts to fail, fluid collects in the lungs which makes it more difficult for the airways to expand hence breathing becomes more difficult. Similarly when the right side of the heart starts to fail, fluid collects in the feet and lower legs causing the legs swell and gain in weight..
The number of people that experience heart failure are 1% of people aged 50 years, about 5% aged 75 years and 25% aged 85 years or older. In United States only, nearly 5 million people are affected by heart failure and every year about 550,000 new cases are diagnosed. The death rate from heart failure is about 10% after 1 year and about half of those die within five years after diagnosis of heart failure. The treatment of the heart failure depends on the exact cause and can be treated effectively. Most candidates for the heart transplantation are those who have not been helped by conventional medical therapy and are the candidates for surgical procedures because of the poor condition of the heart.

## 3. HISTORY

The origin of heart transplantation dated back to 1905 when Alexis Carrel transplanted puppy's heart into a dog however it was not successful because of the lack of the immunosuppressant at that time. Numerous investigations had been performed by different scientists and finally Christian Bernard became successful in first heart transplantation in 1967 in South Africa. The clinical use of cyclosporine as an immunosuppressant brought the revolution in the field of cardiac transplantation in 1983. The survival rates after transplantation also improved. Nearly 60,000 heart transplants have been performed at 300 centers around the world and more than 2000 heart transplants are performed each year in United States alone.

## 4. OUTCOMES

The functional status of cardiac transplantation is excellent on the basis of the survival rate of the recipient.

- 1 year survival rate=81.8%
- 5 year survival rate=69.8%

More than 10 years survival rate is also significant however there is no exact data available.

## 5. PARAMETERS

There are several parameters made for the cardiac transplantation. Some of these are as follows;

- Age of the recipient should be below 65 years
- Potential donor must meet the brain death criteria
- Donor must be free from cardiac pathology
- Follow up care is necessary for the recipient

## 6. COMPLICATIONS

As every therapy has pros and cons cardiac transplantation can not be an exception. Some complications may develop even after successful transplantation. Bleeding from the suture line may occur however this is rare case in the recipient. Another primary concern is of the bacterial infection and some may develop fungal infection. Cardiac rejection is to be expected in the recipient as the body may treat it as a foreign body. Psychiatric disturbances might occur as a result of steroid therapy in the immediate post transplant period.

## 7. METHODOLOGY

This is solely the research paper from previous issues and articles. No other materials are used other than computer and websites. Google search, Medline, Nursing Times and Journal from the Nature have been very helpful for preparing this research paper.

## 8. RESULTS AND DISCUSSIONS

Cardiac transplantation itself is a complex issue in which life of a donor can not be maintained. Further the life of the recipient can be salvaged if the transplanted heart does not function. Hence, the heart transplantation raises many questions. The increasing shortage of donors is the most important factor for limiting the availability of the cardiac transplantation as a waiting list for these lifesaving operations increases. Although many people believe their religion will not allow organ donations, virtually all major religions support it as a humanitarian act. However the repeated surveys show about 90% of the population is in favor of organ donation as we have the responsibility to think what happens to our body when we die. The solicitation of the organs from a dead donor is not unlawful as it can be the life saving step for those patients who have been struggling with the life. This proposal may lead to the significant cultural change to influence people's decisions about what they want after their death. However this is not the only way to increase the rate of heart donation including other organ donation. Multiple strategies are required to fulfill the gap between supply and demand which includes ongoing public education, investment in donor care and some changes in the law.

Another aspect of the cardiac transplantation is the brain death criteria which generates many ethical issues. It is hard to define a person as dead with a heart beat and some intact vital functions supported by the ventilator and intravenous drugs. Brain death, as defined by the medical association, is the disintegration of the brain

cells neurologically, clinically and socially. If we believe in brain death, what should we do in a case of someone who meets the brain death criteria however his heart is still beating and breathing? So many arguments are going on as a heart beating donor can not be declared dead and the ethics of organ donation should be based on principles of respect for the person and nonharming. So the standard definition of death should be the cessation of respiration and cardiac activity.

A Wada case in Japan in1968 raised such ethical issues when a man was pulled from a frozen lake unconscious and declared death on the basis of brain death criteria despite the fact that no law or policy was sanctioned at that time for the determination of death on brain related criteria. On the following day his heart was transplanted by Dr. Wada into an eighteen year old person with chronic heart disease. However he survived for only 83 days after the heart transplantation. Later on Dr. Wada was convicted with the murder but the prosecutor was aborted due to the lack of material evidences. If the person is not yet dead when such organs were removed, he must still have been alive and the removal of the organ thus contradicts the dead donor rule.

Hence, the future cardiac transplantation rests upon several issues as the ongoing shortage of the donor organs has fueled a search for the alternative therapies for the failing heart. Artificial assist devices bridge the gap of the demand and the shortage of the donor for the cardiac transplantation to the some extent. However these mechanical circulatory devices can be associated with adverse neurological events, infection, bleeding and poor outcomes and are contradicted in many patients. Some possible alternative therapies are dual chamber pacing, new drug inventions and genetic therapy.

## 9. CONCLUSIONS

There is no doubt that the cardiac transplantation improves the quality and the longevity of life of those who have serious heart function and will not be able to live without having the heart replaced. However, due to many ethical issues related to the organ donation and its effectiveness, there is always the shortage of the donor organ especially the heart as one can get the heart only after the death of the donor. Further, unlike in the case of other organ transplantation like kidney and liver transplantation patients can not live with a portion of organ. Therefore, the enhancement of the alternative therapies such as Total Artificial Heart, Dual pacing, New drug inventions and Genetic therapies bridge the gap between the shortage and the demand for the cardiac transplantation.

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