Society for Heart Failure and Transplantation

SOCIETY FOR HEART FAILURE AND TRANSPLANTATION'S

THE REVIVAL

Promoting Academics to Improve Clinical Outcomes.

ISSUE : 9 | October, 2021

Society Reg.No.: EKM/TC/186/2013, **Society secretariat:** Address 36/117, 2nd Floor, Lisie Hospital Road, Kottecanal Junction, Kochi 682018.
Ph.: 025750048, **Email:** infoshft@gmail.com, www.sfhft.org

EDITOR'S NOTE

Dr. Manoj Durairaj

Heart Transplant Surgeon, MS, MCh. (AIIMS, New Delhi), FACC.

Director, Marian Cardiac Centre and Research Foundation.

Program Director, Department of Heart and Lung Transplantation, Sahyadri Hospitals, Pune.

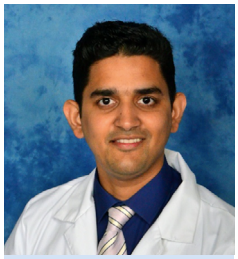
Dear Colleagues.

Greetings from the Editor's desk. This October 2021 issue of the Revival carries an article from one of the legends of Thoracic Transplantation in India, Padmashri Dr Jose Chacko Periappuram. Dr Periappuram has provided his insight into the journey of heart transplantation in our country and his vision for improvement of donor heart utilisation and making the system more efficient. Transformational opportunities like donation after cardiac death can increase the donor pool. He has suggested early alerts (minimum 12 hours before planned harvest time) and a national network for air lifting the organs needs streamlining so that organ transportation facilities be strengthened. An important issue Dr Chacko has alluded to, is late referrals for transplants, making immediate and late clinical outcomes less than optimal. Referring physicians need to be educated and motivated for timely referrals for the best outcomes.

On behalf of the Editorial team, I would like to thank Dr Periappuram for this article and I wish our dear readers "Happy Reading".

- Dr Manoj Durairaj
Editor "The Revival"

SUB EDITOR



Dr. Talha Meeran

MBBS, MD, FACC, Consultant Cardiologist, Dept of Advanced Cardiac Sciences and Cardiac Transplant, Sir HN Reliance Foundation Hospital, Mumbai.

Dear Colleagues,

The journey of cardiac transplants in India began in 1968 and has grown leaps and bounds since then especially over the last decade or so. Owing much to the works of stalwarts such as Dr KM Cherian and Dr Balakrishnan, cardiac transplants has established roots in all major metropolis cities in India. In this edition, Dr Chacko has lucidly painted this journey of cardiac transplant in his words. The section highlighting the cadaveric donation rates and under-utilization of such organs is surprising but nevertheless promises to stimulate areas of further research in this field in India."

Sincerely,
Dr Talha Meeran
Sub Editor "The Revival"

PRESIDENTIAL MESSAGE

Prof. (Dr) V. Nandakumar

Director & Chief, Division of Cardio Vascular/Thoracic Surgery & Cardiac Transplantation, Metromed International Cardiac Centre, Calicut, Kerala.

Dear colleagues,

Greetings from the Society for Heart Failure and Transplantation.

October issue of the news letter 'The Revival' has a very interesting and informative topic 'A Journey Through Heart Transplantation in India'. Dr.Jose Chacko Periyapuram takes you through the history of transplantation in India and the current status. Dr Jose Chacko has not only done the first successful heart transplantation in Kerala, but has made sincere efforts to promote organ donation.

In this article ,he has highlighted the importance of improvement in organ donation rate and maximum utilization of donated organs which will form the foundation for a good transplantation programme in the country

- Prof. (Dr) V. Nandakumar
President

Please call or write to us:

Call: 9822322072, 9167048815,
manojdurairaj@hotmail.com,
talha.meeran@gmail.com

Link for membership,

http://www.sfhft.org/application.html

Special thanks to
Dr Jose Chacko Periappuram
for authoring this month's article.

Designed by Maithili Kulkarni

A JOURNEY THROUGH HEART TRANSPLANTATION IN INDIA

Dr Jose Chacko Periappuram

Consultant and Head of Department of Cardiothoracic Surgery Lisie Heart Institute, Kochi, Kerala, India. Chairman, Heart Care Foundation

Padmashri Dr Jose Chacko Periappuram FRCS (Glasgow), FRCS (Edinburgh), FRCS (CTh) (UK) performed the first successful Heart Transplant in the state of Kerala, India as well as the first ever successful Heart retransplant in the country. Other achievements include the first Beating heart, Awake Bypass and Total Arterial Revascularization surgeries in the state. He is also the Chairman of " Heart Care Foundation", a charitable trust that financially assists poor heart patients.

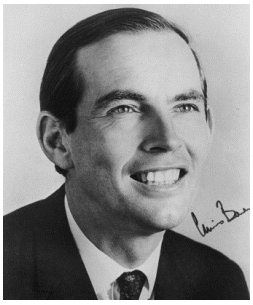
Introduction

Cardiac transplantation is the treatment of choice in patients with end-stage heart disease with significant symptoms and limitation of functional capacity with no medical, interventional, non-transplant surgical and device treatments options left. Also, the recipient should not have any contraindications for transplant and should have reasonable expectancy of life after the transplant to make the procedure worth.

The success story of cardiac transplantation is not won over days or years, but it echoes the progress made in the entire spectrum of medical sciences such as medicine, surgery, immunology pharmacology, infectious diseases, imaging and much more. The initial surgical aspects can be traced to way back in 1890 when Alexis Carrel began experiments with vascular anastomosis followed by animal experiments by Mann and his team at Mayo Clinic, by Demikhov in Russia and by Lower and Shumway's group in the 1930s 50s, and 60s, respectively.

Then came the experience of Xenotransplantation in 1964 of James Hardy who transplanted a chimpanzee's heart to a patient with extensive vascular disease of both legs, who was semi-comatose and in terminal clinical stage. But the animal heart was not able to support the circulation and thus failed. This was followed by the rat race to do the first human cardiac transplantation by many cardiac surgeons including Christiaan Barnard, Richard Lower, Adrian Kantrowitz, and Shumway. The latter three's preparations were delayed due to legal and medical issues related to cardiac death and brain death.

On 3 December 1967, Dr Bernard, performed the world's first successful cardiac transplant on Louis Washkansky at Groote Schuur Hospital Cape Town, South Africa. The heart was harvested from Miss Denise Darvell who met with a road mishap. Adrian Kantrowitz subsequently performed heart transplantation on 6 December 1967, Shumway on 6 January 1968 and Lower in May 1968.



Dr Christiaan Barnard

The initial patient survived for 18 days and died due to a probable rejection. Even though many centres were doing transplants since then, most of the patients succumbed in the postoperative period and 1-year survival was only 11% until late 70s in the very few centres who continued to do the procedure. The surgical aspects associated with the procedure took the focus during the initial days and other clinically important aspects like transplant immunology and infections were not given the deserved importance and this led to increased mortality among those who underwent the procedure leading to the shutdown of many transplant centres across the globe. But, Shumway and his team at Stanford went on with research on many important aspects associated with cardiac transplantation and was instrumental in establishing this fascinating treatment as a medical and surgical specialty.

Indian Scenario

Past

Dr Profulla Kumar Sen became the first surgeon in India to do a heart transplant at KEM Hospital in Mumbai in 1968. He performed the world's 6th heart transplant. Unfortunately, the right heart ballooned within 15 minutes of coming off bypass and the patient died within 3 hours. He attempted another transplant months later but that patient also died within 14 hours with severe pulmonary hypertension. But his work was hampered in those early days of cardiac transplantation by poor results and the absence of laws on brain stem death. There were no further attempts for a long time due to the absence of this law of brain death.3

Dr Profulla Kumar Sen

On 3 August 1994, Dr P Venugopal led a team of doctors in AIIMS in carrying out India's first successful heart transplant. Devi Ram, a 40-year-old heavy industry worker suffering from cardiomyopathy, had been admitted in AIIMS for three months. A 35-year-old lady who had suffered brain haemorrhage was brought into the hospital and her family agreed for organ donation. Devi Ram saw this this is the only way and agreed to heart transplant. "All the conditions were suitable and compatible and so it was decided that the procedure will be carried out...." as Dr. Venugopal recollects.

Dr P Venugopal

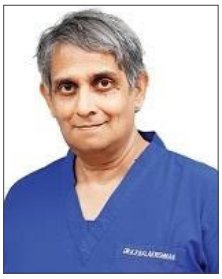
The Transplantation of Human Organ Act (THOA) of India though was passed by the Indian Parliament at that time, it was not signed by the President of India.

Dr.K.M.Cherian is credited with the first heart transplantation after the THOA was passed in 1994 by Indian Parliament. A 36-year-old Hemalatha Soundarrajan was knocked down while crossing the road. She was declared brain dead at his hospital. Her husband was willing to donate her heart. Cherian then contacted many hospitals in Chennai, Cochin, Trivandrum, and even Hyderabad looking for a suitable recipient. Finally, he found the recipient in Chennai General Hospital: Maimoon Beevi, 38 years with dilated cardiomyopathy and had been waiting for a donor heart.

Dr.K.M.Cherian

He is also credited with the many firsts including first bilateral lung transplantation, first paediatric heart transplantation, and first heart lung transplantation in India, and so on.

Dr K. R. Balakrishnan has performed many breakthrough surgeries in the field of cardiac transplant like India's first new generation left ventricular assist device (LVAD) in 2012 and the Heart Ware ventricular assist device (HVAD) pump implant in 2013. He has also played an instrumental role in establishing India's First Comprehensive Centre for Heart Failure Management. He is credited with the highest number of heart transplants in India and also has initiated many transplant programs across the country. He may have to be considered as the father of Indian heart transplant program in the 20th century.



Dr K. R. Balakrishnan

The first successful heart re-transplant in India was performed by Dr. Jose Chacko Periappuram in Kerala in 2014 on a patient who developed refractory right ventricular failure 8 months after the initial transplant. The brave man who underwent India's first heart re-transplant is Mr Girish who is still alive and kicking 8 years after the second transplant.

During these COVID times a special mention needs to be made on the efforts of Dr Sandeep Attawar and his team for the impetus given by him in the field of Lung Transplantation.

Stalwarts in the field of heart failure cardiology over the years have been instrumental in growth of the heart transplant programme. Some of them are Dr K K Talwar, Dr R Ravi Kumar, Dr Sandeep Seth, Dr Jo Joseph and many others who are spearheading this niche speciality.

Present

Even though India contributes to around 18% of the total population of the world, the donation rates in India are abysmally low compared to the rest of the world. In Spain, there are around 32 donations per million; in the USA,

25 donations per million; and in the UK, 17 donations per million population; but in India, there are only 0.5 donations per million.

This is obviously lead to a small number of transplantations taking place across the country even though the numbers are increasing slowly and steadily. There were around 350 cardiac transplants until November 2016, but the numbers increased by 239 in 2017, and 285 in 2018. A total of 250 heart transplantations were done in 2019 making 1,140 total heart transplants so far.

Cardiac transplant centres are spread across the entire length and breadth of the country. The southern state of Tamil Nadu leads the list with the greatest number of donations, transplant centres, and transplants. The state accounts for

more than 50% of the total transplants done in the entire country. This is followed by the states of Maharashtra, Karnataka, Andhra Pradesh, Kerala and Delhi.

The distribution of heart transplant in India is as follows in the order of time.

Delhi has performed so far 126 heart transplants, the first one conducted in 1994 by Dr Venugopal. Tamil Nadu has performed so far 590 heart transplants, with the first one in 1996 by Dr KM Cherian. Karnataka has done 118 hearts so far, the first one conducted by Dr Devi Shetty in 1998. Meantime, Kerala has done 48 hearts so far with Dr Jose Chacko Periappuram performing the first one in 2003.

Andhra Pradesh/Telangana 82 hearts (Dr Gokhale 2004), Rajasthan 4 (Dr Chishti 2015), Maharashtra 152 (P K Sen1968), Gujrat 10 (Dhiren Shah 2016), Punjab 5 (Dr Shyam Thingnam 2017), Madhya Pradesh 2 (Dr Sandeep Srivasthava 2017), West Bengal 12 (Mandana 2018). These figures may not be complete and are based on what is available to the authors at the time of writing this article.

The awareness about brain death, organ donation, and organ transplantation are increasing across the country **(Fig.1)**.

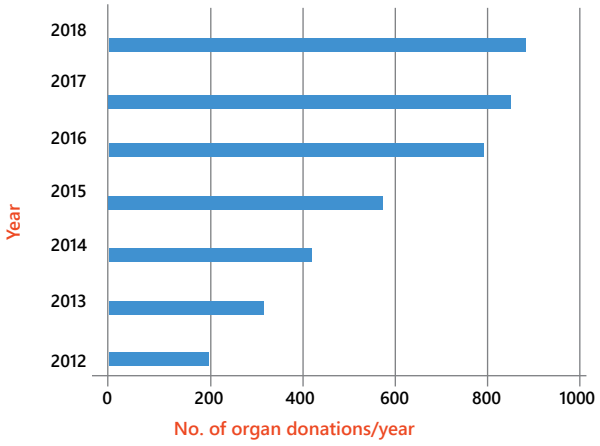


Fig. 1. Deceased multiorgan donations in India from 2012-2018.

The number or multiorgan donations are increasing in India and this has led to a surge or organ transplants for end-stage disease including hearts across the country. But since most of the people do not have access to this life-saving treatment because of multitude or reasons, the underutilization of the donated organs is also a problem in the country **(Fig.2)**.

There are many state level, regional level, and national level coordinating agencies in India helping in procuring, coordinating, and sharing organs across the country. The NOTTO (National Organ and Tissue Transplant Organization) functions as an advisory role for coordinating activities across the national. There are many state level coordinating agencies such as TNOS in Tamil Nadu; JEEVANDAN in Andhra Pradesh and Telangana; ORBO in Delhi; Mohan Foundation, ZCCK in

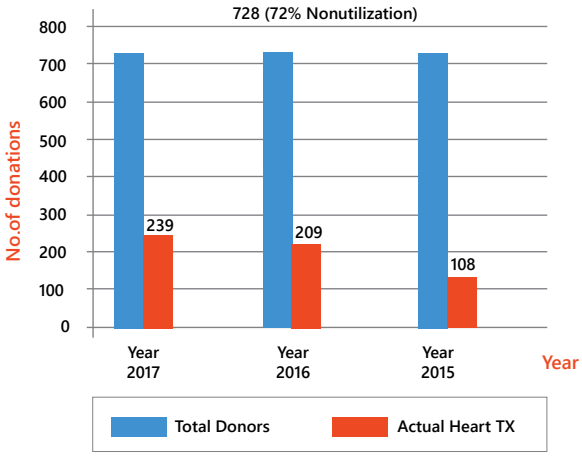


Fig. 2. Donor organ underutilization in India 2015-2017

Karnataka; ZICC in Maharashtra, and KNOS in Kerala. These sorts of systems needed to be created in all states and all the local and regional systems have to be coordinated at the central level for better and optimum donor utilization.

Future

At present, majority of the states do not have a steady recipient list because of the referral bias. Majority of the patients with heart failure (HF) are managed by physicians and cardiologists. So, an important problem is the late referral. Lots of patients are referred late in the clinical course after burning out all available options and after recurrent hospitalizations with HF and this leads to the development of significant pulmonary hypertension making immediate and late clinical outcomes less than optimal. So, physicians and cardiologists need to be educated and motivated for timely referral of these patients for optimum outcomes.

The country needs to augment its donor pool. There should be a national database of the committed donors. The government should take initiatives to link Donor card with Aadhar card for easy retrieval of information. The various stakeholders involved in the process should work faster with efficient interstate allocation, early alert (minimum 12 hours before the planned harvest time), and a national network for air lifting the organs so that organ transportation facilities can be strengthened.

All aspects of donor management have to be streamlined across the country to augment quality of donor management. There is a need for uniform donor management protocol across the country for better optimization of the function of the donated precious organs. Strict protocols should be put in place for better utilization of marginal donors. Transformational opportunities to increase the donation after

cardiac death (DCD) and utilisation of Hepatitis C positive donors would increase the donor pool.

Transplant program in India lack the pyramidal system controlling, and supervising system. Without that, whatever we do, is not going to sustain in progress.

We need to evaluate the National resources, funding and available expertise for organ donation and transplantation. The functioning of regulatory and corporate bodies needs to be evaluated with a view to efficient execution of responsibilities vested on them. Various structures including federal, state, non-governmental organisations and public and private institutions need to co-ordinate the acts. We need to address the issues related to unfair distribution, organ wastage, gaming and poor practices.

Societies and associations need to pull up their socks to create comprehensive registry as mechanisms to audit and police the source and veracity of the data. Meaningful research would be possible only if a comprehensive registry is available.

Collaboration and research at multicentric levels would add good clinical and practical training and research leading to better outcomes. This would help us to succeed training the young surgeons in the field of transplantation. Specialty training and fellowships need to be organised in collaboration of institutions, societies and public and private institutions.

Future proofing of talent is very important in continuity of progress. We need to make a projection of Thoracic organ transplant expertise over the next decade. Knowing the amount of expertise needed to execute the projected work is also to be calculated. We need to prevent the drain of medical manpower as North America and Europe are vast fertile ground for our expertise.

Conclusion

Heart transplantation is a well-established modality of treatment for end stage heart disease where no medical, surgical and device therapy options are available and in the absence of contraindications. The therapy is backed by robust experimental and clinical evidences in various aspects like surgical techniques, immunosuppressive therapy, rejection surveillance, short and long term surveillance. Even though India embraced this therapy in the very beginning, the widespread adoption definitely lagged behind owning to a multitude of factors starting from the legal to the financial constraints. Off late the country is making steadfast progress in this amazing field of science and short term and long-term results available as of now appear promising and the scientific community is committed to provide the best of this therapy to the need ones in the country.

There is an urgent need for Co-ordinated work to save organs and thereby preserving lives. Future is good for India provided we move in the right direction.

REFERENCES:

1. Patterson C, Patterson KB. The history of heart transplantation. Am J Med Sci. 1997;314(3):190-7.
2. Barnard CN. The operation. A human cardiac transplant: An interim report of a successful operation performed at Groote Schuur Hospital, Cape Town. S Afr Med J.1967:41(48):1271-4.
3. Kalra A, Seth S, Hote MP, et al. The story of heart transplantation: From Cape Town to Cape Comorin. J Pract cardiovasc Sci.2016;2:120-5.

PRESIDENT

DR V NANDAKUMAR
Mob: 9843015888
Email: drvnandakumar@gmail.com

PRESIDENT ELECT

DR RONY MATHEW
Mob: 9846097812
Email: drronymathew@yahoo.com

VICE PRESIDENTS

DR JULIUS PUNNEN
Mob: 9980072785
Email: jpunnen@hotmail.com

DR AJITKUMAR V K
Mob: 9895153684
Email: ajitkumarvk@yahoo.com

SECRETARY

DR JABIR ABDULLAKUTTY
Mob: 9447011773
Email: drjabi@yahoo.co.in

JOINT SECRETARY

DR RAJAGOPAL S
Mob: 9747606600
Email: srajagovindam@gmail.com

TREASURER

DR PRAVEEN G PAI
Mob: 9847334434
Email: praveen.pai.g@gmail.com

PAST PRESIDENTS

DR P P MOHANAN
Mob: 9846076006
Email: drppmohanan@yahoo.com

DR JOSE CHACKO PERIAPURAM
Mob: 9847043224
Email: joseperiapuram@hotmail.com

DR GEEVAR ZACHARIAH
Mob: 9846066816
Email: geevarzachariah@gmail.com

MEMBERS

DR C G BAHULEYAN
Mob: 9447344882
Email: bahuleyan2001@yahoo.co.uk

DR P CHANDRASEKHAR
Mob: 9443047152
Email: chanpad@gmail.com

DR COL JAMES THOMAS
Mob: 9892797060
Email: thomasdrjames@yahoo.in

DR JACOB ABRAHAM
Mob: 9847128123
Email: jacabraham1@gmail.com

DR JAYAGOPAL P B
Mob: 9847023777
Email: jaigopallakshmi@gmail.com

DR KARTHIK VASUDEVAN
Mob: 9845281450
Email: karvasudevan@gmail.com

DR C S HIREMATH
Mob: 9481119646
Email: hiremath.cs@sss.hms.org.in

DR MANOJ DURAIRAJ
Mob: 9822322072
Email: manojdurairaj@hotmail.com

DR RAJESH RAMANKUTTY
Mob: 9846005737
Email: drrajesh_mr@yahoo.com

DR V K CHOPRA
Mob: 9560898900
Email: chopravk@gmail.com

DR TALHA MEERAN
Mob: 9167048815
Email: talha.meeran@gmail.com