

## Current scenario and future prospectus of organ transplantation

Rinal Parikh<sup>1</sup>, Kedar Mehta<sup>2,\*</sup>

<sup>1</sup>Intern Doctor, <sup>2</sup>Assistant Professor, GMERS, Medical College, Gotri, Vadodara, Gujarat, India

\*Corresponding Author:

Email: kedar\_mehta20@yahoo.co.in

---

“Organ transplant” is not just a term or a medical procedure, but an idea, a startling yet extraordinary discovery of medical science in the 20<sup>th</sup> century that has undoubtedly saved millions of lives across the world. ‘An organ is a mass of specialized cells and tissues that work together to perform a function in the body’. So what exactly is organ transplantation? “An organ transplantation is a surgical procedure wherein failed or damaged organ in the human body is removed and replaced with a new one.” The donor and recipient may be at the same location, or organs may be transported from a donor site to another location. Organs and/or tissues that are transplanted within the same person's body are called autografts. Tissues transplanted between members of same species are called allografts, which can either be from a living or cadaveric source.

The term ‘organ transplant’ is used to denote transplant of solid organs like heart, kidneys, lungs, intestines, liver and pancreas. Animal and artificial organs may also serve as transplantable organs. Other transplants that are less invasive or may require specialized procedures are tissues such as bones, tendons (both referred to as musculoskeletal grafts), bone marrow, cornea, skin, heart valves, nerves and veins. Worldwide, the kidneys are the most commonly transplanted organs, followed by the liver and then the heart. The most common transplants done are those of Corneae and musculoskeletal grafts; more than ten times those of organ transplants. Organ donors may be living, brain dead, or dead via circulatory death. In individuals who die from brain death or circulatory failure, the maximum time up to which the tissues can be taken for transplantation is 24 hours after the heart stops. Unlike organs, most tissues (with the exception of corneas) can be preserved and stored for up to five years, under proper conditions in specialised storage areas called “banks”.

In the case of living donors, the healthy donor donates a tissue, cell, or fluid (e.g., blood, skin) that can regenerate easily or donates an organ or part of an organ in which the remaining organ can regenerate and there is no harm to the original functions performed by that organ (for example single kidney donation, partial donation of liver, lung lobe, small intestine). Deceased donors (formerly cadaveric) maybe those who are either brain dead or those who collapse due to circulatory failure and are kept on the ventilator in order to donate

their viable organs for transplantation in those recipients who badly need them in order to survive.

The increasing number of safe and effective organ transplantations being done today save people from untimely death due to organ failures and improve quality of life. The advent of antibiotics, massive vaccination programmes and campaigns for the general population to prevent infectious diseases, and organ transplantation may be considered the miracles of twentieth century medicine. Organ transplantation is the best therapy for terminal and irreversible organ failure. Kidney transplantation introduced in the 1950s was the pioneer solid organ transplant to treat patients with end-stage renal disease (ESRD) in an era when renal replacement therapies were in their first steps. The gradual introduction of dialysis increased the recipients’ pool of renal transplant candidates, who may abandon dialysis after a successful transplantation. Earlier during the use of conventional immunosuppressant drugs like azathioprine and steroids, the rejection rates and early graft failure were high, and non-renal solid organ transplant programs without supportive replacement therapies had poor results with very few of them having regular activity until the early 1980s. The introduction of cyclosporine 30 years ago improved transplant outcomes, and solid organ transplant programs were generalized all over the developed world.

The “Apollo Transplant Program” performs the highest number of organ transplants in India. Statistics regarding the organ transplants done in our country of date are easily available on their website-[www.apollohospitals.com](http://www.apollohospitals.com). To mention a few, nearly 150 heart transplants have been done in the country till date. Lung transplants are highly uncommon and only a few transplants are done throughout the country annually, that too in highly specialised centres. As per the latest data, there are 120+ transplant centres in the country performing around 15 heart transplants annually. One of the most successful bone marrow transplant programs in India is run by the Apollo Transplant Institutes, which has conducted 51 bone marrow transplants in the year 2010.

According to the Eye Bank Association of India 16, the number of eyes donated annually is roughly around 45,000. However, only a little more than 50% meet all the medical criteria as per the requirement for quality control of eye banks. Dr Nag Rao, president of the International agency for the prevention of blindness, says that about more than 100,000 corneas

are needed for transplants every year in India. To remove the backlog, the annual need stands at 2.5 lakhs. Lack of awareness is the primary reason behind the shortfall with regards to corneal transplants. Out of the 7.5 lakh deaths annually, roughly 20,000-25,000 (0.3% to 0.4%) of people donate eyes. Hence, India witnesses not more than 12,000-15,000 corneal transplants annually (with a fraction of these being wasted)

The state of Tamil Nadu is the major hub of all activities concerning organ transplantation due to the efforts of MOHAN foundation that initially started from Chennai in the year 1997. Maharashtra has witnessed one of the most recent turnarounds in the Indian content with regards to the success of organ retrieval and transplantation. The incident that triggered this change was the death of former Chief Minister, Mr. Vilas Rao Deshmukh, who passed away due to the unavailability of organs on time.

NGOs including the MOHAN foundation organized Maharashtra Cadaver Organ Donation Day 21 and thereby spread the awareness regarding the value of organ transplantation in saving people from untimely deaths. Some of the recent positive developments include 381 kidney transplants and 21 liver transplants in the nine month period between April 2012 and-December 2012, of which, 332 were live kidney transplants and 2 were live liver transplants 19. The number of deceased organ transplants has doubled in the state in 2012-2013 (nine months) compared to 2011-2012.

The state of Gujarat has had noteworthy success in the case of corneal transplants. The eye donation program in the state has worked well primarily due to the large population of the Jain community in the state, which considers eye donation as a sublime form of charity and believes in a powerful link between 'daan' (charity) and 'moksha'(salvation). More recently there has been a spurt of deceased kidney donation in the state. It should also be noted that unlike Tamil Nadu, both Gujarat and Maharashtra have not been able to establish an organ sharing programme with other states within the country.

Globally, USA has been quite active in the field of organ donation and transplantation and in 1984 the National Organ Transplantation Act (NOTA) was passed in the US wherein an Organ Procurement and Transplantation Network (OPTN) was proposed, which would be supposedly run by a private non-profit organisation under federal contract. In 1986 the Organ Procurement and Transplantation Network (OPTN) was created to increase and ensure the effectiveness, efficiency and equity of organ sharing in the national system, and increase the supply of donated organs available for transplantation. The OPTN gave the initial federal contract to the United Network for Organ Sharing (UNOS), a non-profit organization, which gave promising results in the task. Other countries which have given significant contribution to development and

increase in the organ transplant field are Singapore, Spain, Australia, United Kingdom, etc.

MOHAN (Multi Organ Harvesting Aid Network) is one of the front-running NGOs promoting and taking up the cause of organ donation in India, especially in the case of deceased donors. The organization believes that the shortage of organs can be overcome if the plans are executed properly. MOHAN foundation has taken up state-by-state implementation of the organ transplant awareness initiatives, starting with the southern parts of the country of the 1,300 deceased donations in India, MOHAN foundation has been responsible for 33% (one-third) of the donations.

AORTA, namely the Armed Forces Organ Retrieval and Transplantation Authority have been active in the field of Organ donation, Retrieval and Transplantation across the country. They had organized an extensive drive to promote deceased organ donation in India, during which information was delivered on brain death and organ donation through lectures, posters, billboards and extensive coverage via local and national newspapers in the country. Some of the steps taken up by AORTA are: Establishing organ donor registry at the hospitals, issuing donor cards to the individuals to help them pledge organs in case of brain death, conducting organ pledging ceremonies involving prominent personalities (including movie stars and athletes), honouring families of organ donors to spread the message of organ donation, and so on. Many firsts have been achieved through the initiatives taken by AORTA:

1. For the first time in India, a liver was flown from New Delhi in the north to Hyderabad in the south and transplanted, thereby diminishing geographical boundaries with regards to organ transplantation.
2. Kidneys were transported by air from New Delhi to Mumbai, Pune, Lucknow and Bangalore.

ORBO (Organ Retrieval Banking Organization) has been setup by the All India Institute of Medical Sciences (AIIMS) Delhi with the purpose of encouraging organ donations across the country. It aims to achieve fair and equitable distribution and utilization of organs. Websites like OrganIndia.com also are actively involved in promoting organ donation and transplantation and also provide articles and statistics regarding the same.

Various laws passed at the international levels for organ transplantation include:

National Organ Transplant Act of 1984

The Consolidated Omnibus Reconciliation Act (COBRA), passed by the United States Congress in 1986,

Transplantation of Human Organs Act, India, passed in 1994

While these institutes, some of which are NGOs, as well as legislations passed over the years have worked wonders to uplift the transplantation field in India, several issues regarding organ donation and

transplantation include systematic and infrastructural issues such as:

In the case of living organ donations, if the donor is not related to the patient, the transplant needs to be approved by a state-level committee or hospital committee, including government officials, causing delays in the whole process. In the case of deceased organ donations, few hospitals declare brain deaths and people are not in place to counsel families, both of which lead to a poor conversion rate. Brain death as a form of death is not widely understood or recognized by the public. Also there is hesitation on the part of the medical officers to certify brain death.

In order to conduct a successful organ transplant with the least complications, hospitals need to be fully equipped, in terms of both equipments as well as trained medical personnel and transplant coordinators. Scarcity of ventilators for maintaining brain dead persons, limited facilities for transport of donated organs make the situation worse. Lack of availability of standard transplant procedures in private setups and poor pickup in public hospitals, is a serious concern. Lack of training and awareness regarding the whole transplant procedure and protocols in a big percentage of doctors since it is not part of their formal education curriculum needs to be tackled as soon as possible.

Lack of awareness is perhaps the most important issue at present, followed by religious issues like different mind-sets and beliefs regarding organ donation/transplantation in different cultures resulting in the organs being viewed as a “commodity” instead of “charity” which is unacceptable in certain backgrounds. Besides these, the possibility of facing a transplant rejection after the procedure, which eventually leads to costly treatments and procedures, with the perchance of even death from organ failure in the process, is something which an average middle class and lower class common man cannot afford in our country.

Another aspect, which is perhaps one of the biggest threats to world hierarchy, is the problem of “organ trafficking” The supply-demand gap for donor organs paves the way for illegal transplant and trade of human organs.

WHO defines organ trafficking as those transplants that occur outside of hospitals, including those involving trade in terms of money. The WHO estimated in 2007 that organ trafficking accounts for 5-10% of kidney transplants performed annually across the globe, and that in India, around 2,000 Indians sell a kidney every year. Iran is the only nation that allows organs to be purchased and sold legally, albeit with strict regulations restricting the trade between citizens of the nation only, operating largely on volunteer/charity basis. The rest of the countries worldwide have, in some form or other, either imposed ban on organ trade or made strict laws opposing the same. Yet, a vast

majority of illegal organ trades and transplant tourism still lurk in the background of the world economy, tainting the very sanctity of the procedure.

What then, can we do to increase the rates of legal and ethical organ transplant nationally and internationally?

Spreading awareness about ethical and safe organ donation can be done using the following mediums: Advertising campaigns across all media (TV, Print, Radio, and In-cinema ads) Social Media Celebrity endorsements, Theatre & Street Plays Events to promote organ donation (Marathons, Concerts etc.) On-ground awareness drives at Schools, Colleges, Corporate offices, Clubs etc.

Setting up of a National registry and a centrally managed Organ Donor-Recipient Network, mandating declaration of brain death, increasing cadaveric donations, involving more and more non-transplant hospitals into the process of organ retrieval, and most importantly, fighting against the ethical and religious issues, myths and barriers plaguing our system to save more and more lives using transplantation, are all but a few steps in the direction of a better scope of transplantation science in India and the world.

It is truly said that “organ donors make better lives.” Indian celebrities like Actress and Former Miss World Aishwarya Rai Bachchan has promoted eye donation for a long time through various channels including print media, television advertisements and through events organized by the medical fraternity, actors Amir Khan and his wife Kiran Rao, Priyanka Chopra, and Sports celebrities like Kapil Dev and Gautam Gambhir have also pledged their organs. Various international celebrities like Jerry Orbach, Richard Cass are well known for their organ donations.

Interestingly, modern technology and increasing awareness among the youth have led to more and more involvement of college students, young adults and several NGOs working endlessly in this direction to promote the beliefs of “Recycle Organs, not just Coke Cans” and “The gift of life, Pass it on.” World Organ Donation Day is observed on 6 of August annually throughout the world in order to encourage people to donate organs. August is marked as the “Organ Donor Month”.

Thus, organ donation and organ transplantation may serve as a boon or a curse to the world, depending on how they will be used to shape the future of the people. “Help someone live after your death.” If you haven’t thought yet of donating your organs, then what are you waiting for?! No matter what caste, nationality, education or profession we belong to, we all belong to the race called “human”, so let us make an attempt to become humane by pledging our organs and changing lives.