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REGULATION OF XENOTRANSPLANTATION: POST COVID-19 PANDEMIC

Author –

Mukta Mane

Research Scholar

Department of Law, Savitribai Phule Pune University

ABSTRACT

Coronavirus has changed our lives in a big way. The fear of zoonotic infection has been revamped by Covid-19 to a different level after the wildfire of HIV infection in the earlier times. Accepting any new technology especially using animals will be very difficult. Xenotransplantation is such technology which involves organ transplantation from animal donor to a human recipient. One of the risks involved in this procedure is the transmission of zoonotic infection. This risk can be minimised by way of proper regulation of the technology and along with in-depth research about zoonotic infection. The article focuses on measures to be taken to ensure pathogen-free transplantation and taking care of public health. Post pandemic the role of the World Health Organization and the government has increased to a great extent. Co-operation between different nations and the exchange of information is essential for avoiding COVID-19 like a pandemic.

Keywords - xenotransplantation, zoonotic infection, covid-19, pandemic, regulation

INTRODUCTION

Today's news is buzzing with the toll of Covid-19 positive patients not just in India but throughout the world. This pandemic is a result of animal origin infection i.e. zoonotic infection. Generally, animal infections do not infect humans but in certain cases and circumstances after prolonged contact with the animals, the virus infecting animals undergo genetic changes and then infects humans as well. These zoonotic diseases are not very common otherwise those involved in the industry using animals such as animal husbandry, meat markets would have been always infected by such deadly diseases. Now the question is why are zoonotic infections always deadly and have caused greater harm since ages? May it be HIV AIDS, Zika virus, swine flu and so on, the reason being infection due to unidentified pathogenic agents. In the medical field, there is research going on to find a cure for identified diseases which are caused by known pathogens. Even if these pathogenic agents change or modify their genetic composition the symptoms or causes of the infection are similar hence making it easier to control the spread of the infection in the community. HIV and Covid-19 have spread like wildfire around the world which has sparked fear in the minds.

XENOTRANSPLANTATION

Organ transplantation is used as an alternative medicine for various diseases but the problem with this technology is the shortage of human organs. In order to take care of this problem, the medical scientists over a period of time have discovered that animal organs can be used as an alternative for human organs. This technique is called xenotransplantation. According to this technique, solid organs and fluids can be used as medicine. As there is the exclusive use of animal organs and fluids there are chances of zoonotic infection being transmitted to the human recipient. Researchers are working on minimising this risk by carrying out various studies. Firstly they are collecting information about pathogenic agents in all the potent animal donors such as monkeys, pigs, goats, etc. Then the potential threats to humans will be shortlisted. The researchers will be than studying the causes of these agents in the animal itself so that the infection can be taken care of at that stage itself. Hence according to various guidelines by various agencies throughout the world are giving due importance to pathogen-free animals for the procedure of xenotransplantation. The animals should be raised and kept in a clean and controlled environment. The controlled environment means the food, water and other factors should be monitored before given to the animal. The animals will be under constant surveillance. They need to be tested on a regular basis to check any kind of infection. This is the method by which the threat of any zoonotic infection can be addressed.

POST COVID-19

There are many theories surrounding the origin of Coronavirus, one of them is that the infection has passed to humans from bats in China. Earlier it was seen as common influenza but later it was discovered that it is a serious infection and spreads rapidly. With so much of globalization and people traveling around the world, the virus also traveled globally. The biggest problem is that many of the infected people may not show primary symptoms hence making it difficult to trace the spread of infection. Now all governments are concentrating all their resources towards a cure for the COVID-19 infection along with the preventive vaccine. Extensive research and clinical trials are taking place at the global level. The fear of this infection has changed lives to a large extend. The impact of this infection is seen not just only in the public health care system but also

the financial status of the nations. The major step taken globally was lockdown of the whole country for arresting the spread of the virus. This had brought the entire world to a standstill. The healthcare system around the world is overburdened with patients and the other people carrying out their duties are also getting infected and increasing the burden on the governmental system. It is speculated by the World Health Organization that it will take at least one year to control the spread of the infection. Even after the infection is brought under control there will be fear of zoonotic disease for a very long period of time. Earlier HIV which also zoonotic infection spread like wildfire but the transmission of infection was restricted to contact with body fluids, but in the case of Covid-19 the transmission is rapid through only airborne pathogens through respiratory droplets and the virus can stay active on any surface for a very long time. These factors make it very tricky to control the outbreak in public places. The only way out will be either introduction of vaccine or boosting community immunity against this infection.

Now when we talk about xenotransplantation one of the likely barrier is the transmission of zoonotic infection, after this pandemic people will not be ready to take such chances. So the onus will be on the researchers of this technology to find a method to effectively combat the risk of any infection being transmitted from the donor to recipient. The ethical principles followed in the clinical trials also need to be strict and the pre-trial protocol should be reviewed by an independent ethics committee. Every country should have regulations for xenotransplantation animal facilities. Keeping animals infection-free is the only solution to this problem. At the time of the procedure, the organ or the fluid should be procured at the facility itself in order to avoid any kind of damage or transmission of infection to the animal donor. Before procuring the organ or fluid as the case may be the animal should be tested for any kind of infection and the sample should be preserved for further reference with the details of the animal and human recipient.

Another method to avoid zoonosis would be the study of commonly found viruses in the donor animal species and there likely effect on the human immune system. This research should strictly be carried out in the laboratory only. Scientists working in these laboratories should use appropriate protective gears while in contact with animals with any kind of infection. The tests should be reported to the government as well as the World Health Organization. The current scenario has taught us all a lesson that when there is any outbreak in one country other nations so that global pandemic can be avoided. World Health Organization plays an important role in

establishing cooperation at the international level. Utmost care needs to be taken in case of these researches and they should be isolated from other institutes so that there is no contamination to other sources.

These studies should be carried out by highly specialized doctors and scientists. In case of any public infection, they should be admitted to the separate facility which should be well equipped to handle such kinds of infections effectively in terms of protection to the medical staff and public at large. Contact tracing should be carried out in order to locate the people who had come into contact with the infected animal or human as the case may be. These people even if not infected should be kept under surveillance.

In the case of xenotransplantation clinics which are run by private doctors should be registered under a special category and should be made liable to report the number of patients undergoing xenotransplant procedure and submit their details to the centralised registry which will be maintained by the country along with World Health Organization. Xenotravel or xenotourism which may be carried out internationally should also be registered with the same registry. The sample of the recipient and all the details of the procedure along with the contact details of relatives should be maintained by not just the organization carrying out the procedure but also the national registry. All this data should be made available to the country to which the recipient may travel in the future. Another option might be that there will be a record made in the passport of such a recipient and his or her relative.

The recipient should also refrain from having sexual contact with any person for a specified period of time so that in case of any infection it is not transmitted to his or her partner. Later on, also the recipient should report his or her sexual partner or partners to the institute responsible for surveillance. Doctors should be consulted before planning for a child in the future.

CONCLUSION

Regulating any kind of new technology is necessary to avoid misuse. The governmental organs and agencies play a very important role in regulation and supervising such medical procedures. When it comes to xenotransplantation which is at the research stage and soon will be available to the public at large it is important to lay regulations in such a manner that it does not hamper the

progress of this technology but at the same time does not endanger the public health and safety. We have discussed various additional restrictions which need to be implemented in order to avoid Covid-19 like situation in the future. Xenotransplantation is a boon for the world so regulating it will definitely keep it in good terms and not let it go haywire and cause more harm than good. People will take time to overcome their fear related to any infection from animal sources so it will be the responsibility of the research community to build public confidence by firstly, introducing foolproof methods to take care of the zoonotic infection and secondly, create awareness about the technology.