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World J Transplant 2020 October 18; 10(10): 277-290



OPINION REVIEW

- 277 COVID-19 pandemic: Building organisational flexibility to scale transplant programs
Gopal JP, Papalois VE

MINIREVIEWS

- 283 Combined liver and kidney transplantation in children and long-term outcome
Ranawaka R, Dayasiri K, Gamage M

ABOUT COVER

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COVID-19 pandemic: Building organisational flexibility to scale transplant programs

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Abstract

The prevailing coronavirus disease 2019 pandemic has challenged our lives in an unprecedented manner. The pandemic has had a significant impact on transplantation worldwide. The logistics of travel restrictions, stretching of available resources, unclear risk of infection in immunosuppressed transplant recipients, and evolving guidelines on testing and transplantation are some of the factors that have unfavourably influenced transplant activity. We must begin to build organisational flexibility in order to restart transplantation so that we can be mindful stewards of organ donation and sincere advocates for our patients. Building a culture of honesty and transparency (with patients, families, colleagues, societies, and authorities), keeping the channels of communication open, working in collaboration with others (at local, regional, national, and international levels), and not restarting without rethinking and appraising all elements of our practice, are the main underlying principles to increase the flexibility.

Key Words: Organisational flexibility; Clinical decision making; COVID-19; Organ donation; Care delivery; Transplantation

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Core Tip: We have described our views and the underlying principles regarding building a flexible organisation to optimize the ability to efficiently handle a pandemic. As we are significantly advanced through the pandemic, the desire to go back to routine is gaining momentum, and as most of the programs around the globe are planning to safely restart or

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expand their activity, it is crucial for any organisation to be flexible in order to maintain sustainability.

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INTRODUCTION

An estimate of more than six million people worldwide has been affected by end-stage organ failure^[1]. Scarcity of suitable donor organs for transplantation is already one of the foremost challenges faced by transplant community, and the current pandemic has worsened this even more for various reasons. It has been reported that transplant patients acquiring coronavirus disease 2019 (COVID-19) have increased mortality, with more atypical presentations and longer duration of virus shedding^[2,3]. Loupy *et al*^[4] has reported a strong association between rising coronavirus infections and a marked reduction in the overall number of solid-organ transplantation, even in geographic regions with low infection prevalence. All of these could be devastating for patients awaiting organ transplantation. We should not be withholding life-saving transplant procedures out of fear that our patients might get an infection, instead, we just need to figure out how best to do it safely. Rapid adaptation by the transplant professionals to the evolving circumstances is the need of the hour for getting back on track. This article focusses on the challenges and the potential answers to reinvigorate a flexible transplant organisation during the crisis.

WHO WILL BE TRANSPLANTED?

Re-visiting the transplant waiting lists would be the foremost step while making this challenging decision. Due importance should be given to the following considerations: (1) Immunosuppressing a patient in the middle of a pandemic-does it serve in the best interests of the patient? (2) The risk benefit assessment of proceeding to transplant *vs* waiting in the list; (3) Conservation of healthcare resources; (4) The current status of the patient and their eligibility for transplantation; (5) Patient's wish for and against transplantation considering the pandemic; and (6) Ominous possibility for donor derived transmission. In addition to the above, the need for caregivers should also be considered. There is a complicated dynamic regarding the importance of caregivers accompanying patients to pre and post-transplant visits and during the post-transplant hospitalization and avoiding unnecessary persons into medical facilities. Transplantation of organs that are not immediately life-saving such as the kidney, the pancreas, and the small bowel must be decided on an individual case basis considering the loco-regional prevalence of COVID-19 and whether to introduce immunosuppression in patients and sending them into the community amidst the pandemic. The risk of infection can possibly be mitigated to some extent with the use of low intensity immunosuppression protocol (especially for recipients with a low immunological risk) such as an interleukin-2 receptor antagonist for induction rather than depleting antibodies. Written information pertaining to issues related to COVID-19 pre- and post-transplant should be available to all potential transplant candidates to help them in the decision-making process and to provide an informed consent. It is also vital to acknowledge to the patients about the continuously evolving nature of evidence. Patients must be informed if they are suspended or re-activated on the list. Psychologist consultation prior to the operation could relieve the panic and anxiety regarding COVID-19 for the recipients, as proposed by Wang *et al*^[5].

PREFERRED MODALITY-DECEASED DONATION VERSUS LIVING DONATION

Deceased donor transplantation takes place in an acute setting and is more resource dependent. In order to follow safe transplant practices, screening of the donor and their contacts, the recipient, family members and contacts of the recipient, and healthcare professionals could be more laborious and difficult to do in a timely manner. Organ retrieval or transplantation from COVID-19 positive donors must be avoided at all cost. Team travel for retrieval must be avoided, and local organ recovery teams must retrieve in every possible scenario.

On the other hand, living donor transplantation is often carried out in a planned and elective setting, thus allowing sufficient time to prepare and also has the advantage of shorter hospital stay. Moreover, screening could be much more contained and can be done in a timely way. Donor safety is the utmost priority in living donation. As COVID-19 can be transmitted from healthcare professionals to donors and due to the unknown variables during the evolving circumstances, unfavourable donor outcomes could potentially have a detrimental effect.

In the context of consenting, in addition to the routine risks/complications, the following COVID-19 related issues should be discussed: (1) Risk of donor derived transmission; (2) Risk of nosocomial transmission; (3) Chances of not proceeding to transplantation including logistical issues; and (4) The rationale for social distancing and self-isolation pre- and post-transplant^[6].

The important issue to consider is COVID-19 screening of donors (deceased/ living) and recipients before transplantation. Various transplant societies have published their guidance for screening^[7-10]. While screening and testing strategy varies between jurisdictions, some of the common themes are: (1) Deceased donors should be screened by clinical history and epidemiology in addition to nucleic acid testing (NAT) of the respiratory samples; (2) If testing or test results are not available prior to retrieval, clinical and epidemiological information should be used to screen the donor; (3) Living donors should be tested by NAT of nasal/oropharyngeal specimen and chest X-ray close to the donation (ideally not less than 3 d before donation); (4) Recipients should be tested by NAT before transplantation (while a negative result should not be an absolute pre-requisite for proceeding with transplantation, the decision to wait for the results or not depends upon the turnaround time for results, urgency of transplantation, cold ischemia time, and local policy); and (5) A computed tomography scan of the chest alone or in conjunction with polymerase chain reaction is not appropriate for screening. It is equally important to acknowledge that none of the tests are 100% sensitive or specific, and false positive or false negative results are common.

Boyarsky *et al*^[11] has reported the results of a national survey conducted in the United States linked to COVID-19 and transplantation. In this survey, complete suspension of living donor kidney and liver transplantation were reported by 71.8% and 67.7%, respectively, whereas a majority of the deceased donor programs continued to function with some restrictions, especially in regions with higher incidence of COVID-19. This is in contradiction to most of the centres in the United Kingdom, including our own, whereby a majority of the transplant programs (particularly kidney only or kidney-pancreas units) had to suspend temporarily both the deceased and living donor transplantation, whilst other units had to restrict their donor and/or recipient acceptance criteria. The underlying reasons were the following: To release/create more intensive care beds, to liberate the work force to support intensive care unit, and more importantly, because of increased mortality due to COVID-19 in immunosuppressed individuals.

WHERE TO TRANSPLANT?

The prevailing COVID-19 pandemic has largely depleted the healthcare systems of their capacity to continue transplantation with the transplant team members being redeployed into the care of virus infected patients. Individual programs must assess the local prevalence of infection and the availability of resources for the foreseeable future before expanding/restarting transplantation. Resource consideration should include the availability of the following: Critical care beds, ventilators, blood and blood products, operating theatres, anaesthetic cover with appropriate staffing, organ support services like dialysis machines and their consumables, testing facility, personal protective equipment, and availability of appropriate multidisciplinary team.

Social distancing measures and COVID-free areas in the hospital should be commonplace. Transplant recipients and living donors should be separated from suspected or confirmed COVID-19 infected patients during the in-hospital stay and outpatient visits. Wherever possible, they should be cared for in single rooms or in COVID-19 free wards.

Due to varying extent of resource constraints in different centres, consolidation and sharing of resources would be vital to resume transplant programs. By doing so, transplant centres can consider using “clean sites” or alternative hospital establishments to their original base site in order to carry on their services. As part of the planning measures, the alternative premise should obtain the necessary license to provide transplant services. They should also consider adopting a standard policy or obtaining accreditation for sterilisation and standardisation of equipment. In addition to that, organ perfusion fluids must be stored appropriately, staff who are less familiar with transplantation should have the relevant training and briefing, tissue typing should be done only in accredited laboratories, and the relevant transplant authorities should be kept in the loop in order to co-ordinate the efforts^[12].

As a result of the co-ordinated efforts of various networks, we have restarted the living donor kidney transplant program in an independent sector premise and the deceased donor kidney transplant program at our base hospital in a phased manner with several restrictions to donor/recipient selection (immunologically and surgically low risk patients without needing intensive care unit admission post-transplant) along with changes to the immunosuppression protocol (basiliximab for induction rather than alemtuzumab, tacrolimus and mycophenolate mofetil maintenance rather than tacrolimus monotherapy). Pertaining to the live donor program, the donor, the recipient, and their households were isolating for 14 d prior to transplantation, and were tested at 2 wk, 3 d, and 24 h before transplantation. The medical staff were either working in COVID-19 free sites or working remotely for 14 d prior to transplantation with weekly testing.

WORKFORCE PLANNING

Workforce planning is equally important. Non-transplant professionals could be called in to help. Transplant teams should work with the understanding that they can be asked to come in for work at any time to provide every possible assistance. At the same instance, team members must think about measures for taking care of themselves and ensure they stay healthy to take care of the patients. The risk associated with exposure due to travelling for organ retrieval to high risk areas can be avoided by appropriate use of personal protection measures, and if necessary completely avoiding the high-risk situation. There should be a backup team readily available if in case a staff member falls ill or is isolating. A frequently ignored issue is the mental well-being of the team members. Anxiety and distress owing to virus exposure concerns and grim outcomes in recipients may all contribute. This can be addressed by working closely with the relevant occupational health support services.

FOLLOW UP

Switching over to virtual clinics and remote blood testing facilities is certainly helpful in minimising patient contact and turn over. This is the real arena for technology to produce miracles. Outpatient clinics can be modified such that only urgent visits or patients requiring re-admission need to be seen. Prior to the clinic visit, staff may virtually screen the patients over telephone for symptoms suspicious or compatible with COVID-19. Segregating transplant recipients from suspected or confirmed COVID-19 patients in outpatient clinic is of paramount importance. Clinicians can advise patients to refer to government health websites or transplant-specific websites for guidance and general queries regarding coronavirus.

DEVELOPMENT OF CLINICAL PATHWAYS

All clinical pathways need to be re-written from scratch with emphasis on the following: (1) Doing what is absolutely necessary rather than doing what we are used to or like to do; (2) Logistics should be less complicated and services should adopt a

minimalistic approach; (3) Keeping patients away from the hospital as much as we can; (4) Regular appraisal of performance and outcomes of transplantation; and (5) Defining triggers to pause the program or halt the expansion, if need be. Guidance from professional societies would aid transplant programs in developing their customised clinical pathway. National organ allocation network could identify centres with low loco-regional prevalence of COVID-19 that can resume transplant activities much faster in order to maximise organ utilisation^[13]. Organisations, commissioners, and networks working on developing the clinical pathways should keep in mind that there will be ongoing long-term effects from this pandemic like lengthy waiting lists, resultant increased mortality in the waiting list, and adverse pre-transplant conditions. Therefore, it is of utmost importance to pick the correct momentum to restore completely transplant programs^[14]. In these exceptional times it is very important that we team up together to share knowledge and experience to benefit our patients^[15].

RESEARCH

Even in times of major crisis, research is absolutely necessary, and researchers should continue their work especially in areas such as outcomes in transplant recipients and approach to optimal immunosuppression. A trial of vaccine in transplant patients is definitely warranted and whether a pre-transplant patient should be in early vaccine trials is more controversial, if a vaccine becomes available. As lower intensity immunosuppression protocols are becoming more common, it would be interesting to know if the benefits outweigh the risk of rejection. Research teams should work on virtual meetings with testing or drug dispensing in dedicated areas for research patients in order to avoid contact with unwell patients. Most importantly, research should be patient or disease focused and not carrier-oriented.

CONCLUSION

Bolstering flexibility of transplant programs and rapid adaptation are crucial for successfully navigating through any pandemic. These unprecedented situations are the time for togetherness and not appropriate for politics or blame games. Phased restarting or expansion of transplant programs should be done where emergency and life-saving transplants could proceed earlier, with more elective and quality of life improving transplants phased in later. Consolidation and sharing of resources and safe donation and transplant practices are the efficient ways to get the ball rolling again. These are crucial steps to get us through the current pandemic and similar future challenges.

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