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A Mini Review on Contemporary Kidney Transplant Innovations

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Abstract

Advances in renal transplantation are urgently needed. In this paper, the authors talk about some new developments in renal transplantation and their potential effects on the clinical course of therapy and the options available to patients awaiting renal transplantation. This presentation of innovations won't be exhaustive because the innovations selected are those that are believed to be the most promising in terms of current and future implementation, such as donor pool expansion, immunosuppressive therapies, acute allograft rejection prevention, and future transplantation techniques.

Keywords: Kidney transplant • Kidney donor • Allograft

Introduction

The ECD allocation policy, which established a definition for ECDs, was adopted by the OPTN and United Network for Organ Sharing. Any donor who was 50 years of age or older, or who had two or more serious risk factors, was considered an ECD. A relative risk of graft failure in comparison to a reference group of "ideal donors" was used to define risk factors. Risk factors for myocardial infarction include coronary artery disease, cancer, immune disease, congestive heart failure, peripheral vascular disease, hypertension, diabetes, and portal hypertension. The use of ECD kidneys was justified by the five-year patient survival and graft survival rates when compared with "ideal donor" kidneys. Similar findings regarding the use of ECDs were found in a different study by the Euro transplant Senior Program. The data collected over a 5-year period did not reveal any appreciable differences between patients who received kidney transplants from elderly donors via ECD and those who received younger kidneys via the standard allocation. Recent studies with similar findings have been compared to the aforementioned findings.

Literature Review

Additionally, due to a lack of viable organs, 13 people pass away every day while waiting for a kidney transplant, and more than 3,000 people are added to the waiting list each month on average. While they wait for a kidney transplant, some patients choose to undergo dialysis. However, a dialysis patient's average life expectancy is only 5 years, compared to a kidney transplant patient's 8 to 20 years (8–12 years for a recipient receiving a kidney from a deceased donor and 12–20 years for a recipient receiving a kidney from a living donor). 1 Additionally, dialysis patients have a lower quality of life in terms of basic freedoms like the capacity for employment and travel [1].

Description

There hasn't been a significant rise in the number of elderly people in the United States who donate kidneys. This stagnant growth in the use of ECDs has been largely attributed to what has been seen as a lack of vision and reluctance to depart from established dogma. One can only hope that this practise will continue to be supported by research and that using ECDs will be an effective way to donate kidneys in the future. Additionally, that the United States will adopt this strategy and benefit from what is thought to be an untapped pool of reliable donors. There is currently a dearth of organs available in the United States for transplantation into patients with chronic illnesses. Over 100,000 people were in need of kidney transplants as of 2019, according to the US Department of Health and Human Services Organ Procurement and Transplantation Network (OPTN). According to the US Renal Data System, the median wait time for a person to receive their first kidney transplant is 3.6 years, though this can vary depending on the patient's health, the organ's compatibility, and the organ's availability. About two thirds of the more than 17,000 kidney transplants performed in 2018 used deceased donors.

Innovations in kidney transplants

The use of DKT, a technique that makes use of outdated, subpar donor kidneys, is another suggestion made to improve KT success. As was previously mentioned, these kidneys would be referred to as ECD kidneys. However, in this situation, both kidneys from the donor would be used, as opposed to just one kidney. This approach would be taken if the donor had died of documented and verified cardiac or neurological causes. This strategy is predicated on the idea that a single kidney transplanted from any given donor will not be enough to add sustained kidney function. Overall, only 2% to 4% of all KTs performed in the United States are performed using this technique. Currently, a single kidney transplant is preferred to make the most of the United States' small donor pool [2]. Using ECD kidneys from deceased donors, some centres have reported their experiences with DKT over the past ten years. Although these reports lacked a control group, they are still important to note in this case. A 1-year graft survival of 87% to 96% was reported in eight reports (n 5 290). Numerous studies have revealed comparable patient and graft survival rates when these results were compared to those attained after a single KT with ECDs.

Approximately 60% of ECD kidneys from donors older than 65 are currently being discarded in the United States. It would be sufficient to remark that, in light of the evidence so far, their use in DKT would be preferable than full rejection. Despite the fact that it seems like a good option, the studies utilised to compare single KT versus DKT in ECD are significantly smaller in size. In order to further justify the use of ECD kidneys for DKT, more trials would be needed.

It would change how this patient population is managed if nursing implications regarding the use of ECD kidneys for single and dual KT strategies were to become apparent. It would result in more effective and efficient care for these patients during the critical period before transplantation [3]. Optimizing the patient's current medical condition with prompt, evidence-based nursing

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care would be of the utmost importance during the phase when an ECD is judged viable or is undergoing donor verification. If this strategy is used in the future within the United States, optimization of current medical state would enhance and further support appropriate conditions deemed necessary for proceeding with KT.

The aim of the clinician is to prolong the function of the renal graft using an immunosuppressive therapy regimen after a kidney transplant. This, however, is not always possible due to graft rejection brought on by the host's immune system response either right away after the transplant or years later. AMR is getting worse, especially at transplant facilities that perform high-risk transplants [4]. One issue is that the clinical manifestations of AMR and T-cell-mediated rejection (TCMR) symptoms are largely heterogeneous, making diagnosis challenging and necessitating the use of ineffective therapies. As a result, for both acute and chronic AMR versus TCMR, new diagnostic methods and classification categories were updated at the 2015 Banff kidney meeting.

Immunosuppressive therapy advancements over the past two decades have lagged behind renal transplant advancements. Tacrolimus and cyclosporine were first introduced in the 1980s and 1990s, respectively. Both of these medications are extremely nephrotoxic, despite having lower rejection rates than their predecessors. Newer medications have been introduced in the twenty-first century, but their use is restricted because of efficacy worries. Overall, the researchers came to the conclusion that maintenance should consist of a combination of tacrolimus, mycophenolic acid, and prednisone until the efficacy of new medications is demonstrated to be on par with that of current regimens [5-7].

Conclusion

Health care practitioners must utilise CAP cautiously due to the potential long-term negative effects of antibiotics. Reduced usage of antibiotics will slow the spread of bacterial resistance in both the individual and the population levels. Limiting antibiotic use will also have a positive impact on a child's microbiota, which is increasingly understood to be crucial to healthy body development and function.

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Conflict of Interest

There is no conflict of interest by author.

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