An immunological analysis of kidney transplantation

Uma análise imunológica do transplante renal

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1 INTRODUCTION

Kidney transplantation is indicated for patients with end-stage renal disease (CKD), characterized by progressive and irreversible loss of renal function (VERÍSSIMO, 2021). Surgery can be performed from a living or cadaveric donor, with the aim of preserving renal function, minimizing ischemia and preserving the arteries and veins of the region (MANFRO; CARVALHAL, 2003). However, acute rejection is a major concern in this process (VERÍSSIMO, 2021). Donation from a living donor presents a lower risk of rejection, but finding a suitable donor can be complex, since it is also exposed to surgical risks (MANFRO; CARVALHAL, 2003). In this sense, the recipient's immune system plays a key role in the success or failure of the procedure, and the development of immunosuppression has gradually increased the life expectancy of transplantation. Therefore, it is essential that the individual adopts a new lifestyle and takes care of himself aiming at the quality and quantity of life (BRAHM, 2012).

2 OBJECTIVE

The aim of this work is to analyze the main immunological aspects involved in the process of kidney transplantation, understanding the importance of the recipient's immune system and the immunosuppression strategies used to ensure the success of the procedure. Through this immunological analysis, the study aims to contribute to the advancement of knowledge in the area and provide subsidies for improving the results and quality of life of patients undergoing renal transplantation.

3 METHODOLOGY

This is a literature review, developed with articles published from 2003 to 2021 in the electronic databases: Portal Capes, *Scientific Electronic Library Online* - Scielo and Google Scholar, using the descriptors: Kidney, immune system, kidney transplant, donor and their respective synonyms, in Portuguese and English. Titles and abstracts were screened and the full texts of studies considered potentially relevant were assessed. Only published articles dealing with the topic and available *online* were included in this review. Articles that did not address the topic and were not available *online* were excluded.

4 DEVELOPMENT

The immune system plays a crucial role in the success or failure of the kidney transplant procedure, due to the development of immunosuppression, which has contributed to the gradual increase in graft life expectancy. Careful selection of kidney transplant candidates is performed based on criteria such as ABO blood type, which determines the allocation of patients on a single national list, ensuring fairness criteria in organ distribution. In addition, HLA typing tests are performed, which involve blood samples to determine the compatibility between donor and recipient tissue, in order to identify possible contraindications to transplantation, such as the presence of antibodies from the recipient against donor HLA antigens. These contraindications can lead to hyperacute, acute or chronic rejections, depending on the genetic incompatibility between donor and recipient (TIZO & MACEDO, 2015).

To ensure the success of the transplant, recipients undergo immunosuppression after the procedure, using clinical protocols authorized by the Ministry of Health. These protocols usually include a combination of three therapeutic classes: corticosteroid, such as prednisone; calcineurin inhibitor, represented by cyclosporine (CsA) or tacrolimus (TAC); and an antiproliferative agent, such as azathioprine (AZA), mycophenolate mofetil (MMF) or mycophenolate sodium (MFS) (BRASIL, 2013). Although immunosuppression has been fundamental to the success of kidney transplants, there is still room for improvement and refinement in the strategies used. Future research, such as xenotransplantation, the development of immunological tolerance, gene therapy and organ cloning, may contribute significantly to reducing the morbidity caused by chronic immunosuppression, increasing the number of transplants performed and prolonging the survival of transplanted organs (MANFRO and CARVALHAL, 2003).

In view of the information presented, it is essential to evaluate and individualize the treatment, considering the patient's comorbidities, in order to increase the chances of success, minimize side effects and immunodeficiencies. In addition, it is necessary to consider the particularities of the donor and the organ, the immunological risk and the aggravating factors related to the procedure (MANFRO et al., 2006).

5 FINAL CONSIDERATIONS

Based on the evidence presented in this review, it is imperative to promote the continuous development of research in the field of immunology, especially in relation to innovative strategies aimed at individuals on the waiting list for kidney transplantation. The aim of such research is to establish interventions that ensure adequate graft preservation and promote patients' well-being. In addition, it is of utmost importance that physicians and other healthcare professionals involved in the follow-up of these individuals provide clear guidance on the importance of strictly adhering to immunosuppressive treatment and convey to the patient an understanding of the potential harm resulting from inadequate therapy.

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