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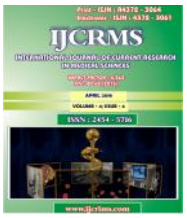

Review Article

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Kidney transplantation in patients with DKA - A Review

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Abstract

Kidney transplantation is the preferred method of RRT; however, blood transfusion or peritoneal dialysis is often required before, during, and after transplantation. When silicopurine was introduced in 1983, the rate of kidney transplantation from dead donors improved significantly with a 1-year, with a survival rate of 85 to 95%, compared with 65% of azathioprine and steroids. Results of the Literature review were exported to Endnote. Prior to the formal screening process, a calibration exercise was undertaken to pilot and refine the screening. Formal screening process of titles and abstracts were conducted by two researchers according to the eligibility criteria, and consensus method was used for solving controversies among the two researchers. The full text was obtained for all titles that met the inclusion criteria. Kidney transplant donors may be dead or alive, and living donors may be related or non-kin. Since organ donation from inferior donors is inadequate, the pressure to donate kidney to living individuals has increased. Non-kin blood donors can be eligible for donation with a close and sustained emotional relationship with the recipient or the person who agrees to renal kidney replacement as part of the kidney transplant program. The survival of grafts from non-living donors, despite the adaptability of human anthelokocyte antigen (HLA), is better than the survival of grafts from dead donors.

Keywords: Kidney transplantation, DKA, Review

Introduction

Kidney transplantation is the preferred method of RRT; however, blood transfusion or peritoneal dialysis is often required before, during, and after transplantation (1). When silicopurine was introduced in 1983, the rate of kidney transplantation from dead donors improved significantly with a 1-year, with a survival rate of 85 to 95%, compared with 65% of azathioprine and steroids (2). Reduction in acute rejection and improvement in the long-term survival of allograft after the introduction of newer immunosuppressive agents including Rapamycin, Mycophenolate Mofetil, Tacrolimus, and Interleukin-2 Anti-Recurrent Antibodies (Daclizumab and Basilix Mab) has been reported commonly afterwards (3).

1.1.Search strategy

Searches were conducted by two independent researchers in international (PubMed, Web of science, Scopus and Google scholar) and national

(SID, Magiran) databases for related studies from the inception of the databases to September 2017 (without time limitation) in English and Persian languages. To ensure literature saturation, the reference lists of included studies or relevant reviews identifed through the search were scanned. The specifc search strategies were created by a Health Sciences Librarian with expertise in systematic review search using the MESH terms and free terms according to the PRESS standard . After the MEDLINE strategy was finalized, it was adapted to search in other databases. Accordingly, PROSPERO was searched for ongoing or recently related completed systematic reviews. The key words used in the search strategy were "Kidney transplantation and DKA" which were combined with Boolean operators including AND, OR, and NOT.

1.2 .Study selection

Results of the Literature review were exported to Endnote. Prior to the formal screening process, a calibration exercise was undertaken to pilot and refine the screening. Formal screening process of titles and abstracts were conducted by two researchers according to the eligibility criteria, and consensus method was used for solving controversies among the two researchers. The full text was obtained for all titles that met the inclusion criteria. Additional information was retrieved from the study authors in order to resolve queries regarding the eligibility criteria. The reasons for the exclusion criteria were recorded. Neither of the review authors was blinded to the journal titles, the study authors or institutions.

Types of kidney transplantation

Kidney transplant donors may be dead or alive, and living donors may be related or non-kin. Since organ donation from inferior donors is inadequate, the pressure to donate kidney to living individuals has increased (4). Non-kin blood donors can be eligible for donation with a close and sustained emotional relationship with the recipient or the person who agrees to renal kidney replacement as part of the kidney transplant program. The survival of grafts from non-living donors, despite the adaptability of human anthelokocyte antigen (HLA), is better than the survival of grafts from dead donors (5). The main benefits of a kidney transplant from a living relative donor are: less ischemic injury and better tissue adaptability. The consistent matching of HLA has always been high in graft survival and shows less likelihood of rejection of renal transplantation from less consistent dead or viable donors. However, with methods to reduce antibodies, such as plasma and treatment of pre-transplant immune suppression, there is a possibility of successful kidney transplantation in abnormal pairs of ABO (6). Treatment with prophylactic immunosuppressive drugs and graft rejection therapy are among the main factors in the success of kidney transplantation (7). All methods for immune system restraint involve disrupting the lymphocyte cell cycle, and many of them include periods of use of τ and β-steroids. After the introduction of cyclosporine in the early 1980s, the number of drugs that could inhibit the immune system has risen steadily (8).

The cytochrome P-450 system is essential for the metabolism of cyclosporine, tacrolimus and rapamycin. Significant changes in the level of these drugs occur when patients start taking or stopping taking medications that can induce or inhibit this system. Therefore, the evaluation of drug interactions is necessary to prevent the toxic or even non-toxic effects of an immunosuppressive agent or other prescribed treatments (9).

The cyclosporine activates its immune system by inhibiting lymphocytes in the G0, G1 phases of the cell cycle. Some of the most serious side effects of cyclosporine include suppression of the blood system, hypercalemia, seizure, gout, dyslipidemia, and gingival hypertrophy (10). Most of these effects respond to the correct dosage reduction. The most notable complication is nephrotoxicity, often resulting in a decrease in glomerular blood flow. Tacrolimus has a mechanism of action and side effects similar to cyclosporine, but has additional hyperglycemia and high tendency to neurotoxicity. Both cyclosporine and tacrolimus can cause

nephrotoxicity of calcineurinase inhibitor, and can be effective in chronic renal nephropathy and ultimately loss of graft (11).

Mycophenolate mofetil or mycophenolic acid specifically inhibits the proliferation of T lymphocyte and lymphocyte-B by interfering with or synthesizing purine and thus DNA synthesis (12). Mupiflucal mycophenolate is associated with a reduction of 60 to 70% in acute rejection compared with conventional treatments, and thus causes long-term survival of the graft. Rapamycin is a macrolide antibiotic produced by the Higroscopicus Streptomyces fungus. Rapamycin binds to the Mtor receptor, and thus the phosphorylation of p70 (s6) kinase and the 4E binding protein of the buccinate initiator factor, PAHAS-1, are plated. This action leads to inhibition of cytokine and the activity of the growth factor in non-immune cells and lymphocytes T, B. Major side effects include thrombocytopenia and dyslipidemia (mainly hypertriglyceridemia) (13).

Pentoxifylline

Pentoxifylline is a xanthine independent derivative which, despite being a vasodilator, t its major activity is to reduce the viscosity of the blood, possibly due to its ability to alter the shape of RBCs and reduce platelet aggregation and adhesion. This drug increases the blood flow to ischemic tissues and improves oxygenation in tissues in patients with peripheral vascular disease. It also increases the oxygen pressure in the cerebrospinal fluid and the cerebrospinal fluid. This drug is easily absorbed from the digestive tract (14). This drug has the effect of first-pass liver metabolism. Some drug metabolites are active, the half-life of the drug is 8 to 4 hours, and often the untreated drug is excreted in the urine over a period of 24 hours, mainly as a metabolite.
This medicine should not be used in cases of cerebral hemorrhage, severe retinal hemorrhage, severe arrhythmia, and acute myocardial infarction. Nausea, digestive disturbances, dizziness, headache, burning up, angina, palpitations, heart arrhythmias and excessive allergic reactions have been reported. The effect of hypertension medications, if used concurrently with this drug, is exacerbated (15). The serum levels of theophylline increase when co-administered with this drug.

This drug is easily absorbed from the digestive tract, but under the first pathway is the liver metabolism, with some active metabolites. Its half-life is between 4 and 8 hours, varying from 1 to 6 hours for its metabolites. Within 24 hours, most of the dose is excreted in the urine and mainly in the form of metabolites, and less than 4% is excreted while defecation (16).

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