THE ROLE OF BIOCHEMISTRY IN ORGAN TRANSPLANTOLOGY

Nazirova Shakhriza Bakhodirovna
Student of Samarkand State Medical
University of Pediatrics faculty
shaxrizodanazirova62@gmail.com

Abstract: Transplantation is the power of human interaction with medicine, which takes into account all the laws and rights of the country and religion. It will develop day by day to increase the skills of scientists and professionals while solving problems associated with other diseases.

Keywords: transplantation, professionalism, experimental, clinical, histological, recipient, autotransplantation, isotransplantation, allotransplantation, malignant tumors, homotransplantation, to hay transplantation, biochemical monitoring, biomarkers, organ transplantation, risk management

In medicine, transplantation is considered to be the transplantation of any organ or tissue, for example, kidney, heart, liver, lung, bone marrow, hematopoietic stem cells, and hair. Transplantation is divided into experimental and clinical. experimental transplantation needed How preclinical stage in development all biological, surgical, and histological problems related to transplantation of concrete bodies or fabrics. Experiments suggest the transplantation of practically any fabric or organ. experimental transplantation is needed for further study of the immune reactions of the recipient after transplanting donor bodies and fabrics. experimental transplantology It has the same big meaning for the development of new drugs (cyclosporine), conducive to normal adaptation of transplanted genetically diverse bodies and fabrics. In turn, transplantation is divided into 4 types.

Clinical biochemistry is used to a greater or lesser extent in the assessment of potential donors, the selection and assessment of patients for transplantation, and in perioperative and postoperative monitoring. Transplantation surgery requires some special biochemical support but many of these demands are not unique to this

situation. Some of the postoperative requirements for intensive care of cardiac and liver transplant recipients will be similar to those of other patients, particularly in the case when multiorgan failure occurs. The monitoring of organ function of renal and hepatic transplant recipients will be similar to that of those with reversible failure of these organs. A major role of clinical biochemistry in these patients is in the monitoring of immunosuppressive therapy.

Immunosuppressive medications are essential for the pharmacotherapy of autoimmune illnesses as well as for the inhibition of immune response and avoidance of graft rejection. In patients receiving transplanted organs, immunosuppression occurs in four stages: desensitization, induction of immunosuppression, maintenance therapy, and management of episodes of graft rejection. Positive treatment outcomes and a sufficient safety profile are essential for effective immunosuppression. However, in routine clinical settings, a sizable fraction of patients receiving immunosuppressive therapy may exhibit either excessive or insufficient immunosuppression. For immunosuppressive medications, therapeutic drug monitoring (TDM) is a crucial but insufficient tool because of the unpredictable nature of drug exposure and the significant pharmacokinetic variability brought on by various factors, such as genetic variations in drug transporters and metabolizing enzymes. Therefore, to successfully optimize and individualize therapy for transplant patients and provide the best possible medical outcomes, parallel therapeutic, biochemical, and clinical monitoring may be used.

Certain biochemical biomarkers may be monitored to detect early organ damage, side effects from immunosuppressive therapy, and/or organ rejection. As a result, it might offer a sufficient assessment of the therapeutic safety profile. Although the usual biochemical markers of organ injury play a significant role in transplant patients' biochemical surveillance, there is a persistent drive to identify novel, targeted markers that could signal alterations in subcellular structures and potentially avert complications. This study aimed to highlight the significance of developing novel biomarkers that would allow for the early identification of side

medication events and cellular damage in organ transplant recipients. Furthermore, we aimed to validate the significance of consistent biochemical monitoring in enhancing the security of immunosuppressive therapy.

Standard biochemical measures, such as serum levels of creatinine, urea, potassium, sodium, and calcium, and urine levels of albumin, α1-, and β2-microglobulin, can be used to evaluate renal function. While they might attest to the fact that kidney damage exists, they are insufficiently specific in identifying the processes and locations of damage. This suggests that more targeted early cell damage biomarkers should be investigated to potentially provide a suitable medicinal response. Serum creatinine's dependence on age, gender, muscle mass, muscle metabolism, co-administered medications, and hydration status is its primary drawback. Also, serum creatinine concentrations may not change until a significant amount of kidney function has already been lost. Moreover, only a few days post-transplantation, when steady-state equilibrium has been reached, serum creatinine concentration shows the accurate status of the kidney function.

Current immunosuppressive regimens need to minimize medical expenses while improving patient quality of life and graft survival rates. Reasonable pharmacotherapy in recipients of transplants is predicated on therapeutic drug monitoring. However, because of medication pharmacokinetic variability and genetic polymorphisms, TDM is not a sufficient tool for attaining the best possible treatment outcomes. This could result in unanticipated clinical reactions. In general, data about the patient's condition and the graft can be obtained through routine biochemical monitoring, which is helpful for risk management. Appropriate treatment is possible when rejection events or the harmful effects of specific immunosuppressive medications are detected early.

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