

Abstract

Kidney transplantation is the best treatment for patients with end-stage renal failure. The main problem of kidney transplantation is however the development of a cellular and antibody-mediated (humoral) rejection. During the last decade, thanks to the advanced immunosuppression, prognosis of survival and function of transplanted organs has significantly improved. Nevertheless, humoral rejection remains very serious obstacle in high-risk patients, because it can permanently damage the graft. Therefore, before transplantation it is necessary to stratify patients into high and low risk groups for development of antibody-mediated rejection. Current immunogenetic tests performed before transplantation include, in addition to HLA typing, detection of panel-reactive antibodies. However, this test does not provide information about B cells which participate in the humoral response of the kidney recipient. Therefore, in the presented thesis we studied B cell reactivity and its regulation in transplanted patients.

In this retrospective analysis we measured levels of the B cell activating factor, a cytokine regulating the function of B lymphocytes (BAFF). Current reports suggest that BAFF could serve as a marker of humoral rejection. Furthermore, we focused on B lymphocytes and their capacity to produce antibodies using an IgG ELISpot assay (Enzyme-linked immunosorbent spot). Literature studies indicate that IgG ELISpot could predict the production of antibodies and thus the risk of development of humoral rejection after transplantation. Concentrations of BAFF and ELISpot results were correlated with the development of humoral or cellular rejection and with selected immunological risk factors for rejection (eg. HLA, donor-specific antibodies).

Our data indicate that patients with humoral rejection have a trend of lower levels of the BAFF cytokine after transplantation than patients free of rejection. Using the IgG ELISpot assay, we found that prior to transplantation from living donors patients with humoral rejection have significantly higher frequencies of antibody producing B cells. This method could be used to determine the risk of antibody-mediated rejection after kidney transplantation.

Key words: antibody-mediated rejection, BAFF, ELISpot, HLA antigens, immunoglobulin G, Luminex, kidney transplantation