ABSTRACT

Long-term renal graft acceptance still requires long-term immunosuppressive therapy, which is accompanied by many adverse effects. Contrarily insufficient immunosuppression could lead to graft rejection and its failure. Therefore, research continues for biomarkers that reflect a patient's immunological status and thus allowing for individualized immunosuppressive therapy. In our study we showed lower incidence of acute rejection in kidney transplant recipients treated with rabbit anti-thymocyte globulin (rATG) or basiliximab induction within the first three months after transplantation. The rATG induction caused profound decrease of recipient's peripheral blood T and NK cells, as well as transcripts that are exclusively expressed by these cell types together with expansion of regulatory T cells (Tregs) among $CD4^+$ T cells. In rATG group the increase of two transcripts associated with rejection (*MAN1A1* and *TLR5)* was also observed in early post-transplant period. After the basiliximab induction we transiently detected $CD4^+CD25^{low/-}FoxP3^+$ cell population along with disappearance of $CD4^+CD25^+FoxP3^+$ Tregs. Basiliximab induction resulted in a transient increase in $CD4^+FoxP3^+$ Tregs, accompanied by the highest peripheral expression levels of markers associated with operational tolerance (*FOXP3* and *TCAIM*). Higher post-transplant $CD4^+FoxP3^+$ Tregs to $CD8^+CD45RA^+CD62L^-$ effector T cells ratios were observed in those basiliximab treated patients who were rejection free during a follow-up. Further, we demonstrated that kidney transplantation is associated with modulation of $CD14^+CD16^+$ and $CD14^+CD163^+$ monocyte subpopulations partially affected by an immunosuppressive regime used. We showed the up-regulation of several operational tolerance-associated B-cell-related genes also in renal transplant recipients on standard immunosuppression who were rejection-free during one-year follow-up. We assume that new biomarkers of tolerance represent a hope for future post-transplant monitoring, however, their utility need to be validated in prospective clinical trials.