# Infectious diseases and their impact on the development and progression of renal graft dysfunction

Infectious diseases represent a significant risk factor for morbidity and mortality among organ transplant recipients. In renal transplant recipients, infectious complications are the most common cause of death with preserved graft function.

Cytomegalovirus (CMV) infection is one of the most common opportunistic infections after solid organ transplantation. Despite the routine use of modern preventive measures, CMV infection puts kidney transplant recipients at higher risk of graft failure and mortality. In addition to direct action, CMV also has an immunomodulatory ability that is associated with an increased risk of T-lymphocyte-mediated and possibly antibody-mediated graft rejection in particular, both of which limit long-term allograft survival. The two main strategies for CMV prevention include (1) universal prophylaxis with treatment of all patients at risk (according to donor-recipient serostatus) with antiviral drugs and (2) preventive therapy based on CMV monitoring and treatment of only selected patients with significant viral replication (DNAemia). The current International Consensus Guidlines consider both strategies equivalent in patients after kidney transplantation, even in the high-risk subgroup of seronegative recipients from seropositive donors (D+R-). Here we present the randomized "OVERT" trial from our transplant center that directly compares valganciklovir prophylaxis with a preemptive approach in kidney transplant recipients in terms of efficacy in reducing the indirect effects of CMV. The difference in the incidence of acute graft rejection at 1 year was not statistically significant between the both regimens. However, prophylaxis was associated with a lower risk of subclinical rejection at 3 months. Although both regimens were effective in preventing CMV disease, the incidence of CMV DNAemia (including episodes with higher viral loads) was significantly higher with preemptive therapy.

Kidney transplant patients are at high risk of coronavirus disease 19 (COVID-19), caused by severe acute respiratory syndrome coronavirus type 2 (SARS-CoV-2), with a severe course and high mortality. Despite standard and adjuvant SARS-CoV-2 vaccination, a significant number of solid organ recipients remain without a satisfactory serological response. The presented randomized trial evaluates the efficacy and safety of one and two booster doses of SARS-CoV-2 mRNA vaccine in renal allograft patients in an effort to optimize the adjuvant vaccination schedule. In this study, we showed that sequential administration of two booster doses of SARS-CoV-2 mRNA vaccine is safe and significantly increases the rate of positive antibody response in renal transplant patients compared to a single booster dose.

Key words: kidney transplant recipients, infection, cytomegalovirus, SARS-CoV-2, prevention, vaccination