

Leukopenia and neutropenia post-renal transplantation: A multi-centred retrospective cohort study

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Background

Leukopenia and neutropenia are common complications after renal transplantation with the use of modern drug regimes. We investigated the incidence, risk factors for and the effects of leukopenia and neutropenia, including the development of serious infections (opportunistic infections requiring immunosuppression reduction or infection requiring hospital admission) and allograft function.

Methods

We performed a retrospective analysis of 193 kidney and kidney/pancreas transplant patients from a single transplant programme between 2015 and 2016. All patients received a tacrolimus, MMF (intention for 2g/day for all during the period of the study) and prednisolone-based regime. All patients received valganciclovir for 6 months except for CMV donor IgG negative/recipient IgG negative cases (23%).

Results

The median follow-up time was 1036 (IQR 738-1392) days. The incidence of leukopenia was 56% and neutropenia 36%, with the first episode occurring with a median time of 90 (IQR 61-137) days and 100 (IQR 70-146) days post-transplantation, respectively. Females were significantly more likely to develop leukopenia (females 65%, males 51%; $p=0.048$) and neutropenia (females 45%; males 30%; $p=0.027$). Patients receiving a second or subsequent transplant were more likely to develop leukopenia [74%; median time 21 (IQR 4-101) days] as well as having a shorter time to its first episode ($p=0.019$; $p\leq 0.001$), as compared to those receiving their first kidney transplant [53%; median time 92 (IQR 69-152) days]. All other baseline characteristics did not show association with the development of leukopenia and neutropenia. Receiving valganciclovir prophylaxis for CMV infection, increases the chance of developing leukopenia and neutropenia ($p<0.001$; $p<0.001$). Development of neutropenia also increased the likelihood of developing infections (neutropenia 71%, no neutropenia 52%; $p=0.009$). The development of leukopenia was associated with a poorer graft function at 1-year [eGFR 55 (SD 22) ml/min/1.73m² versus eGFR 64 (SD 16) ml/min/1.73m²; $p<0.001$] and 2-years post-transplantation [eGFR 55 (SD 24) ml/min/1.73m² versus 63 (SD 19) ml/min/1.73m²; $p=0.028$]. Patients who developed leukopenia or neutropenia had increased rates of allograft failure compared to those who did not [8% and 10%, versus 0% and 2% ($p=0.011$)].

Conclusion

This study illustrates that there is a high incidence of leukopenia and neutropenia in our post-renal transplant population which associated with poorer outcomes. Risk factors included female sex and previous transplantation with valganciclovir use being a potentially modifiable risk factor. Factors identified in this study can help provide a better understanding of the development of leukopenia and neutropenia in this cohort and potentially help better guide clinicians in the management of such patients.