**Pharmacokinetics, clinical characteristics, and long-term outcomes in kidney transplant patients: A 10-year retrospective review**

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**Abstract**

Successful kidney transplantation depends on multiple factors, including the immune response to the allograft. Calcineurin inhibitors (CNIs) are important in achieving this immunosuppression, but wide variability exists between individuals' drug concentrations creating a double-edged sword for the clinician. Under-dosing leads to a significant risk of acute graft rejection but over-dosing increases the risks of unwanted side effects. Therapeutic drug monitoring is used to guide immunosuppressant dosing but relies on post-exposure measurements which predispose patients to significant risk of adverse reactions. Better approaches are needed to determine effective dosages of immunosuppressive agents before, or immediately after, kidney transplantation.

This **10-year retrospective review** of kidney transplant patients at Charlotte Maxeke Johannesburg Academic Hospital (CMJAH) focuses on the pharmacokinetics of CNIs **cyclosporine and tacrolimus** and their correlation with clinical outcomes. Drug blood concentrations at various time points post-transplantation, time-taken to achieve the target concentration, and factors such as gender, ethnicity, and donor type (living or cadaver) were analysed. The impact of antibody induction, smoking, and alcohol status on patients' pharmacokinetics and transplant outcomes were also investigated along with the correlation between pharmacokinetic parameters, biopsy-proven acute rejection and chronic allograft dysfunction. Furthermore, we examined the incidence of hypertension and post-transplant diabetes mellitus, two common complications that can significantly affect patient prognosis. Our findings highlighted the significant pharmacokinetic variability among patients and probed the influence of individualized medication dosing to potentially reduce rejection rates. Our preliminary data indicates a possible link between these conditions and drug pharmacokinetics, underscoring the need for personalized therapeutic strategies.