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Fall in leukocyte count for monitoring of immunosuppressive and anti-cancer drug therapy

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Background: The therapeutic window between efficacy on the one side and toxicity on the other side is very narrow for many immunosuppressive, anti-viral and anti-cancer drugs. The present contribution is to review the literature data and our own experience with regard to the value of a leukocyte monitoring for efficient drug therapy.

Methods: If there is leukocytopenia at least an effect can be assumed. Since the beneficial effect and the adverse effect are frequently better correlated than the drug concentration and the target effect, monitoring of leukocytes might be more cost-effective than monitoring of drug concentrations. A selective PubMed research was undertaken, therefore, to look for publications where the monitoring of leukocytes is used for targeting the drug dose.

Results: The use of cyclophosphamide has been successfully introduced for treatment of systemic vasculitis by adjusting the dose to the leukocyte count. A leukocyte nadir was found to indicate a better prognosis in lung cancer and testicular cancer patients. A better outcome has been associated with cancer chemotherapy targeting neutropenia than with lower dose. This is in agreement with our own experience on the intravenous cyclophosphamide pulse therapy in IgA nephritis. This regimen applies also to the monitoring of azathioprine or mycophenolate and to ganciclovir and valganciclovir or cidofovir. However, a threshold nadir for leukocyte count must be defined to avoid persistent agranulocytosis.

Conclusion: Leukocytopenia is an effect of immunosuppression, of anti-viral or anti-cancer drug therapy. This easy to measure lab parameter can be used for pharmacodynamic monitoring of the efficacy of the critical dose drug therapy.

Biography

Frieder Keller has completed his MD and Post-doctoral studies from Free University, Berlin. He was Head of Nephrology Division at Ulm University and is a Teacher in Clinical Medicine. He has published more than 250 papers in PubMed cited journals and is serving as an Editorial Board Member of *Clinical Nephrology*.

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