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Optimizing JC and BK polyomavirus IgG testing for seroepidemiology and patient counseling

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Highlights

- JCPyV and BKPyV serology may help to identify patients at risk.
- Serial serum dilutions provide semi-quantitative JCPyV- and BKPyV-IgG ELISA levels.
- For seroprevalence, 200-fold dilution is best (false-positive 1%, false-negative 1%).
- For patient counseling, 100-fold dilution is most sensitive, but needs preadsorption.

Abstract

Background Polyomavirus JC (JCPyV) and BK (BKPyV) can cause significant diseases in immunocompromised patients including nephropathy, hemorrhagic cystitis, and leukoencephalopathy. Recently, JCPyV and BKPyV IgG have been explored as risk predictors in multiple sclerosis and transplant patients, but sensitivity, specificity and quantification issues limit current performance.

Objective To improve JCPyV and BKPyV-specific antibody testing.

Study design Healthy blood donor sera (N=400) were tested at dilutions 1:100, 1:200, and 1:400 for JCPyV- and BKPyV-specific IgG using VP1 virus-like particle (VLP)-based ELISAs normalized to a laboratory reference serum. Normalized optical density_{492nm} greater or equal 0.1 in all 3 dilutions were regarded as reactive. Sera with discordant reactivity in at least one dilution were retested after VLP preadsorption.

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