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# Epstein-Barr virus - the prevalence of antibodies and varying assay sensitivities

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**Background:** Epstein-Barr Virus (EBV) is a prevalent infection that can progress into infectious mononucleosis and occasionally Guillain-Barré syndrome and viral meningitis. EBV recrudescence may occur following immunosuppression administered to allow stem cell or organ transplantation. As a result, serological testing is performed pre-donation to establish EBV status and the risk of recrudescence. However, it is uncertain what the optimal algorithm for serological testing is. This has been highlighted in conflicting publications, including public health laboratory guidelines. To address this we have analysed the capacity of different serological assays to discriminate the anti-EBV status of a panel of plasma samples.

**Material/methods:** Anonymised plasma donations from healthy donors were sourced from the NHS Blood and Transplant (NHSBT) service at Colindale between January and November 2016. These plasma donations were screened for the presence of EBV early antigen (EA), EBV nuclear antigen (EBNA), viral capsid antigen (VCA) IgG and IgM antibodies using the DiaSorin Liaison XL platform. Results were stratified in accordance with the 2015 Public Health England (PHE) recommendations. Some plasma samples were also evaluated in commercial, CE-marked manual kits.

**Results:** Of the 275 collected samples, 76.73% plasma donations were found to be negative for viral capsid antigen (VCA) IgM antibodies and positive for VCA IgG and EBV nuclear antigen (EBNA) IgG antibodies, indicative of a past infection. Only 1.45% indicated a recent acute infection. 5.82% of donations were positive for EBNA IgG, VCA IgG and VCA IgM, which is deemed as an inconclusive result according to the PHE guidelines. 20 samples were identified as VCA IgM positive samples and were subsequently tested on commercially available manual kits obtained from Siemens (Novagnost EBV-VCA IgM) and Bio-Rad (Platelia EBV-VCA IgM), where 90% yielded negative result.

The PHE report does not include EA as a means of determining an EBV serological profile. Nevertheless, 34.67% of all donations screened were positive for EA IgG.

**Conclusions:** There is an uncertainty as to the most appropriate laboratory testing regime to determine the serological status for EBV. This study shows that a contributing factor to this may be the use of assays with different sensitivities, especially in regards to the detection of anti-EBV IgM responses. The regular application of external controls can contribute to more reliable diagnosis of EBV infection status and allow labs to assess assay sensitivity and suitability for use in a diagnostic environment. As a result, the QCRU section at NIBSC is producing QC reagents that discriminate anti-EBV antibodies that may be employed assure the quality of these assays.