Expression of Epstein-Barr virus antibodies EA-IgG, Rta-IgG, and VCA-IgA in nasopharyngeal carcinoma and their use in a combined diagnostic assay

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Received August 5, 2015
Accepted November 24, 2015
Published March 18, 2016
DOI http://dx.doi.org/10.4238/gmr.15017368

ABSTRACT. Epstein-Barr virus (EBV) infection is closely associated with nasopharyngeal carcinoma, which can be monitored by the levels of Rta protein antibody IgG (Rta-IgG), early antigen antibody (EA-IgG), and viral capsid antibody (VCA-IgA). In the present study, we investigated the serum levels of Rta-IgG, EA-IgG, and VCA-IgA in nasopharyngeal cancer patients, and the diagnostic value of a combined assay that includes these antibodies in addition to the EBV-DNA. A total of 56 nasopharyngeal cancer patients were recruited as the study population, along with 48 benign rhinitis patients and 42 healthy individuals. Serum EA-IgG, Rta-IgG, and VCA-IgA levels were measured by enzyme-linked immunosorbent assay,
and EBV-DNA was quantified with PCR. The diagnostic value of these indices was further evaluated by ROC curve analysis. The expression levels of EA-IgG, Rta-IgG, VCA-IgA, and EBV-DNA were elevated in the nasopharyngeal cancer patients, who had higher levels of these antibodies than those in the rhinitis patients, followed by the healthy individuals. These indices were also increased with advanced TNM stage. The overall diagnostic efficacy was ranked as follows: VCA-IgA, Rta-IgA, EA-IgA, and EBV-DNA. The combined diagnosis using these four indices increased the sensitivity to 98.21% and the negative predictive value to 98.61%, without any significant compromise on the test specificity. In conclusion, EA-IgG, Rta-IgG, VCA-IgA, and EBV-DNA expression levels were elevated in nasopharyngeal patients. The combined diagnostic value of these serum indices has important implications in nasopharyngeal carcinoma.

**Key words:** Nasopharyngeal carcinoma; EBV DNA; Combined assay; VCA-IgA