EVALUATION OF A NEW SYSTEM FOR THE SEROLOGICAL DIAGNOSIS OF EPSTEIN-BARR VIRUS INFECTION

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Introduction. Epstein Barr virus (EBV) belongs to the Herpesviridae family, and it is also known as human herpes virus 4. In the industrialized countries, approximately 50% of the population before puberty is seropositive for EBV.
The laboratory diagnosis of primary infection is based on serology with the detection of heterophile antibody (Monotest)and of specific anti-EBV antibodies. The anti-EBV antibodies normally detected are 5: anti-VCA IgG/IgM, EA IgG/IgM, EBNA IgG. The titration of the specific antibodies is performed to confirm the clinical finding and to assess the immunological status of the patient for EBV.
Aim of this work was to evaluate a new method, VIDAS EBV, developed by bio-Merieux with the Chorus EBV, DIESSE Diagnostica Senese SpA, used in the Vimercate laboratory. Both systems are automated.

Methods. The study was performed on 204 samples, not duplicated, from in- and out-patients.
Chorus EBV is based on the ELISA principle and the available panel is composed by anti-VCA IgG and IgM and anti-EBNA IgG. VIDAS EBV is based on the ELFA technology. The panel is composed of anti-VCA/EA IgG, anti-VCA IgM and anti-EBNA IgG.

Results. The overall agreement between the two methods was 96%. The patients have been divided in3 groups on the basis of the results obtained by the Chorus DIESSE. The analytical results are reported in table 1.

TABLE 1	**PAST INFECTION**				**NEGATIVE SEROLOGY**				**ACUTE INFECTION**			
	CHORUS		VIDAS		CHORUS		VIDAS		CHORUS		VIDAS	
	POS	NEG	POS	NEG	POS	NEG	POS	NEG	POS	NEG	POS	NEG
VCA IgG	98	0	98	0	0	52	0	52	30	24	42	12
VCA IgM	0	98	0	98	0	52	1	51	54	0	51	3
EBNA IgG	98	0	98	0	0	52	2	50	0	54	2	52

Samples from 98 patients with past infection have been processed with a concordance of 100%.
52 samples with negative serology according to the Chorus method have been processed by the VIDAS method obtaining a concordance of 94%, the discordant samples were 3 in total.
54 samples with evidence of acute infection have been processed and the concordance between the two methods was 91%, with 5 discordant samples.

Discussion. Heterophile antibodies show some drawback in the diagnosis of EBV infection, both for false negative (10 – 15% in adults and higher in children) and false positives (cross-reactivity with other Herpesviridae). In these cases, it is necessary the titration of specific antibody by means of automated and rapid systems such as those we have evaluated. The overall concordance (96%) indicates a good level of superimposability between the two methods under evaluation.

Among the patients with negative serology 3 gave different results with the VIDAS system: 2 were EBNA IgG positive, indicating a past infection. The third discordant sample was VCA IgM positive by the VIDAS system. The patient, further to showing leukocytosis with inversion of the formula and activated lymphocytes in the peripheral smear, resulted positive to CMV IgM and IgG (acute CMV infection). The VIDAS method has therefore evidenced cross-reactivity with other Herpes viruses. The discordant samples have been further tested by both methods, and the results were confirmed.
A higher discordance has been found in case of recent or actual infection: 5 samples out of 54. Three samples with evidence of acute infection by the Chorus method resulted positive for EBNA IgG by the VIDAS method, finding suggestive of a past infection. All of the 3 samples were positive by the Monospot test, had abnormal hepatic enzyme activities, lymphocytosis with activation without inversion of the formula neutrophiles/lymphocytes. 2 samples resulted negative by the VIDAS EBV kits, while they resulted positive for VCA Igm by the Chorus method. It is worth noting that the level of positivity was just above the cut-off. Further to this, other laboratory findings did not support the hypothesis of an acuteinfection. The samples positives by the Chorus method were re-tested but they've not been subjected to further testing by other methods.
The VIDAS EBV method allowed to better define the serological status of the patient due to a clear-cut definition of the cut-off for each antigen.
Further to the concordance between the two methods, we want to highlight that in both cases the serological analyses have been performed using user-friendly instruments well accepted by the laboratory staff.

Conclusions. Both system resulted reliable, easy ti use and rapid under an instrument point of view. The VIDAS allows an easier determination of the serological status of the patient due to the clear-cut definition of the cut-off.