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# P0548 Detection of IgG antibodies against West-Nile virus NS1 antigen

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**Background**: West-Nile virus (WNV) is a flavivirus that causes flu-like symptoms in about 20% of infected humans. In < 1% of infections, neurological complications, e.g. meningitis, occur. Laboratory diagnosis of WNV infection predominantly relies on the detection of specific antibodies. ELISA based on highly conserved viral glycoprotein E are very sensitive but also cross-reactive with antibodies against other flaviviruses produced after infection or vaccination. In this study, we validated the sensitivity and specificity of a newly developed Anti-WNV ELISA based on the non-structural protein 1 (NS1) which is less conserved within the family of flaviviridae.

**Material/methods**: This study included the following human sera collectives: 1) Paired samples from nine meningitis patients with suspected WNV infection from Algeria. Samples were consecutively collected early after symptom onset at an interval of 4-8 days. WNV infections were confirmed by either detection of viral RNA or IgG seroconversion. 2) Samples from 500 healthy blood donors. 3) 90 patients tested positive for antibodies against Dengue (DENV, n=27), Hepatitis C (HCV, n=6), Zika (ZIKV, n=20), Tick borne encephalitis (TBEV, n=25) or Yellow fever virus (YFV, n=12) with ELISA or neutralization test. Samples were analysed with the Anti-WNV NS1 ELISA IgG and a commercial Anti-WNV ELISA IgG based on glycoprotein E (Euroimmun AG, Germany).

**Results**: WNV-specific IgG seroconversion and/or a ≥ 2x increase of IgG level between the two consecutive blood samplings was determined with both ELISA in all patients from collective 1 (sensitivity 100%). 1.8% of healthy blood donors were reactive in the Anti-WNV NS1 ELISA compared to 2.2% in the Anti-WNV ELISA (specificity 98.2% vs. 97.8%). In collective 3 the NS1- and the glycoprotein E-based ELISA showed identical or similar reactivity with patient sera positive for antibodies against HCV (0.0%), ZIKV (90.0% vs. 95.0%) and YFV (0.0%). Major differences in cross-reactivity were observed in samples positive for anti-DENV (11.1% vs. 77.8%) and anti-TBEV (4.0% vs. 20.8%) IgG.

**Conclusions:** Both ELISA showed a high sensitivity in clinically characterized samples from WNV patients. Assay specificity was higher using NS1 as target antigen, particularly with respect to patient sera positive for antibodies against DENV and TBEV.