

**P0057 Comparison of enzyme-linked immunosorbent assays for the diagnosis of dengue virus infections**

Ann-Kristin Gebhardt<sup>1</sup>, Oliver Klemens<sup>1</sup>, Konstanze Stiba<sup>1</sup>, Sandra Saschenbrecker<sup>1</sup>, Katja Steinhagen\*<sup>1</sup>

<sup>1</sup> Institute for Experimental Immunology, EUROIMMUN AG, Lübeck, Germany

**Background:** Dengue virus (DENV) is a mosquito-borne flavivirus that causes a febrile illness in humans, occasionally leading to severe hemorrhagic fever and shock syndrome. After viraemia, the laboratory diagnosis is based on antibody detection which can be complicated due to cross-reactivity with other flaviviruses. Here, we compared the performance of two ELISAs based on different DENV antigens.

**Materials/methods:** The study included 124 follow-up samples (day 0-196) from DENV-infected travellers. Additionally, we examined sera from 688 healthy individuals and 95 patients with previous flavivirus contact, i.e. vaccination against or infection with tick-borne encephalitis virus (TBEV), yellow fever virus (YFV), hepatitis C virus (HCV), West Nile virus (WNV) or Zika virus (ZIKV). Samples were analysed for anti-DENV IgM and IgG using the Anti-Dengue Virus Type 1-4 ELISA based on purified DENV particles and recombinant glycoproteins E of DENV1-4. In addition, IgG reactivity against DENV non-structural protein 1 (NS1) was examined by an ELISA coated with recombinant NS1 of DENV1-4.

**Results:** Of the samples taken on day 0, anti-DENV1-4 antibodies were positive in 36% (IgM) and 40% (IgG), but only 13% reacted positively in the NS1-based IgG ELISA. Among sera obtained between day 6 and 14, 100% were anti-DENV1-4 positive for both IgM and IgG, while anti-DENV NS1 IgG positivity was detected in 70% of cases. In samples taken later, the prevalence of anti-DENV1-4 IgM steadily decreased, whereas both IgG ELISAs reached positivity in 100%. Specificities of the different ELISAs were 94-99% with respect to healthy individuals. However, in the cross-reactivity panel, the NS1-based IgG ELISA was more specific than the anti-DENV1-4 IgG ELISA (83% vs. 49%), with deviations observed in TBEV-vaccinated (100% vs. 68%) and WNV-infected (93% vs. 33%) patients. Highest cross-reactivity (100%) occurred with anti-ZIKV IgG antibodies.

**Conclusions:** The Anti-Dengue Virus Type 1-4 ELISA IgM and IgG is capable of detecting all DENV infections in the time window predestined for serodiagnostics, thus presenting a valuable screening tool for acute infections and epidemiological studies. By comparison, the NS1-based IgG ELISA has the advantage of reduced IgG cross-reactivity, but limited sensitivity in early stages of infection.