

**O0502 A novel microfluidic nanoparticle-based immunoassay method for detection of dengue virus NS1 antigen: evaluation for the diagnosis of acute dengue virus infections**

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**Background:** Dengue is the most important arbovirus and the fastest growing vector borne disease worldwide. Dengue virus infection has a large range of clinical manifestations, from asymptomatic or mild disease to a severe hemorrhagic fever. The number of travellers returning from dengue endemic countries is increasing. A rapid diagnostic test is needed to improve patient management and to apply measures to prevent local virus transmission in non endemic areas where the vectors are present. The non structural protein 1 (NS1) of dengue virus is a glycoprotein secreted from infected cells and can be used for the diagnosis of acute dengue virus infections.

The objective of our study is to evaluate a new rapid and semi-quantitative microfluidic dengue NS1 detection method based on aggregation of magnetic nanoparticles detected by an electronic reader (Virotrack Dengue Acute and Blubox, BluSense). The test is a simple rapid test that provides results in 10 minutes.

**Materials/methods:** A panel of 48 acute serum samples (37 dengue, 6 chikungunya and 5 zika) from confirmed arboviral infections by specific real time RT-PCR was tested by three different tests targeting the NS1 antigen: SD Dengue NS1 Ag ELISA, NS1 Dengue Duo rapid test (immunochromatographic method) and ViroTrack Dengue Acute Samples were collected on days 0-9 after symptom onset and dengue cases included the four dengue serotypes (1-4).

**Results:** The results for sensitivity and specificity of each test compared to confirmed cases by real time RT-PCR diagnosis are shown on Table 1.

	S	E
Virotrack Dengue Acute	94.6%	100%
Dengue Duo NS1	75%	100%
ELISA NS1	97.3%	100%

The ViroTrack and ELISA methods showed a very high sensitivity and specificity, and only failed to detect the NS1 protein in secondary dengue infections, which are much less common in travellers.

**Conclusions:** The results show that the ViroTrack Dengue Acute assay is sensitive and specific assay for dengue NS1 detection. It provides faster results than the ELISA method and a better performance than the rapid immunochromatographic tests. ViroTrack Dengue Acute could be a valuable tool to rapidly diagnose dengue in returning travellers from endemic countries