A comparison of serum and urine samples for the detection of Zika virus RNA in a high prevalence population using a real-time PCR based assay

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BACKGROUND

Accurate and reliable ZIKV diagnostic tests are an important tool to limit the spread of ZIKV infections.

Sample types play an important role in proper diagnosis of the infection.

The first cases of ZIKV infection in Ecuador were reported in January 2016 in two returned travelers. Shortly thereafter, autochthonous transmission was documented in the country.

Ecuador has tropical areas with high incidence of arboviral infections, like Dengue, Chikungunya and recently also Zika.

In some rural areas it may be challenging to have access to healthcare and molecular testing is not available.

AIM

To compare the detection of ZIKV RNA in both plasma and first-void urine samples from symptomatic cases clinically diagnosed in remote areas of Ecuador between April and June 2017.

METHODS

A total of 95 symptomatic patients were recruited.

First-void urine samples were obtained using the Colli-Pee device (Novosanis, Belgium), whereas blood samples were drawn using EDTA tubes.

Samples were stored at 4°C until transportation at various temperatures depending on local logistics.

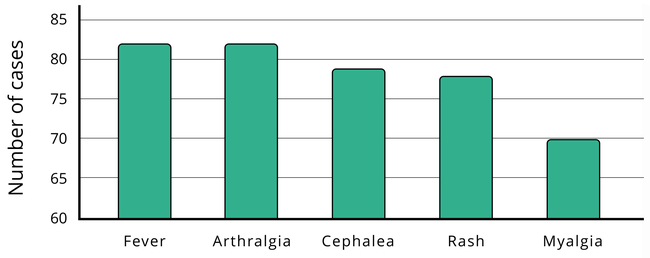
Upon arrival in the lab the samples were stored at 4°C until RNA isolation.

ZIKV was detected using a validated, laboratory-developed RT-PCR (the ZCD assay) within two weeks after sampling with a QiaAmpViral extraction kit (Qiagen, Germany).

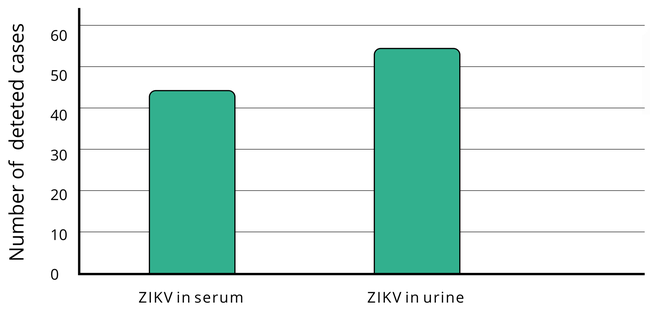
Table 1.- Patient characteristics

Patient characteristics	
Total number of patients	95
Age in years	30 ±15.4
Sex ratio M/F	0.66
Average duration of disease in days	4.88

Graphic 1. Most frequent symptoms of ZIKA infection in the studied population



Graphic 2. Detection of ZIKV in serum and urine



Graphic 3. Positive cases. Concordance of results in first-void urine and serum

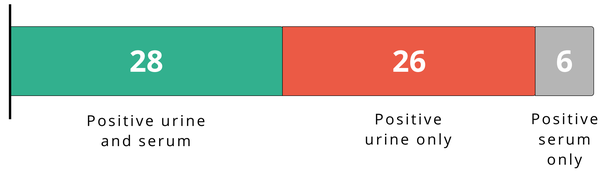


Image 1. Colli-Pee™ device (Novosanis, BE) used for first-void urine collection

CONCLUSIONS

Our results highlight the usefulness of simultaneously testing multiple specimen types in order to increase the possibility of ZIKV RNA detection.

First-void urine and serum collection for molecular testing should be a routine approach for evaluating patients for ZIKV infection.

Urine is a very good alternative sample type when blood collection is not possible.

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