PP-1
Clinical and virological characteristics of the first two outbreaks of dengue in a region without a past history of dengue

Murugananthan K[1*], Coonghe PAD[2], Kumanan T[3], Murugananthan A[1], Selvaratnam G[3], Sivansuthan S[4], Sathiadas G[5], Ketheesan N[6], Careem MFA[7] and Noordeen F[8*]

[1]*Department of Microbiology, Faculty of Medicine, University of Jaffna*
[2]*Department of Community and Family Medicine, Faculty of Medicine, University of Jaffna*
[3]*Department of Medicine, Faculty of Medicine, University of Jaffna*
[4]*Teaching Hospital, Jaffna;* [5]*Department of Paediatrics, Faculty of Medicine, University of Jaffna*
[6]*Australian Institute of Tropical Health and Medicine, James Cook University, Australia*
[7]*Department of Ecosystem and Public Health, University of Calgary, Alberta, Canada*
[8]*Department of Microbiology, Faculty of Medicine, University of Peradeniya*

*Email: kalamathy6@gmail.com ; faseeha.noordeen12@gmail.com

The reported dengue cases have been increasing since 2009 in the Northern part of Sri Lanka, which did not have a history of dengue before 2009. The current study evaluated the clinical, non-specific and specific virological laboratory profiles including platelet counts, dengue viral (DENV) NS1 antigen and anti-DENV IgM/IgG as correlates of DENV infection in the two initial outbreaks preceding the dengue epidemic in the northern Sri Lanka.

This study was carried out using patients' samples collected from the medical and paediatric wards of the Teaching Hospital, Jaffna during the first two dengue outbreaks in 2009/2010 (outbreak 1) and 2011/2012 (outbreak 2). A total of 765 patients with clinically suspected dengue satisfying the case definition of Ministry of Health, Sri Lanka 2011 and 2012 were recruited to the study. Samples were tested for DENV NS1 antigen, DENV nucleic acid using RT-PCR anti-DENV IgM and IgG using ELISA (Pan Bio Diagnostics, Australia). Platelet counts were determined using an automated haematological analyzer (Mindray, China) as a routine laboratory procedure for patients suspected of having dengue.

The findings of the study are many-fold: Firstly, an age shift was noted among the dengue cases between the 2 outbreaks. Mean age of 2009/10 and 2011/2012 outbreak were 25.31± 15.4 years and 26.83±15.8 days, respectively. Secondly, the percentage of patients with headache, retro orbital pain, arthralgia and flushed extremities, pallor, haemorrhages and effusion were significantly different between outbreak 1 and outbreak 2 ($p<0.005$). Thirdly, there was a shift in the DENV serotypes noted in outbreak 1 and 2. Fourthly, DENV NS1 antigen detection was useful for the early detection of recent DENV infections and the association of DENV NS1 detection in patients with fever days less than 5 was statistically significant ($p<0.005$) and it could be used as the substitution for RT-PCR in the laboratory detection of DENV infections. Fifthly, detection of anti-DENV IgG in the early part of the illness would help to identify secondary DENV infections in the clinically suspected patients. Finally, the combination of platelet count, DENV NS1 antigen, anti-DENV IgM and anti-DENV IgG detection could diagnose more than 90% of the dengue cases and it will help the clinicians to make decision on hospitalization of patients during their first visit.

Keywords: Dengue, Clinical characteristics, Virological characteristics, Past history

Funding: The research grants from the Higher Education for the 21st Century (HETC JEN/O-MED/N7) from the MoHE, Sri Lanka and Australian Direct Aid Program are acknowledged.