SECTION A

001/A

Rapid differential diagnosis of dengue and chikungunya infections by multiplex RT-PCR and impact of chikungunya infection on liver biochemical tests

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Outbreaks of chikungunya infections on a background of sporadic cases of dengue have become a major public health concern in Sri Lanka. In such situations, rapid and differential diagnosis is considered extremely important to deliver appropriate therapeutic intervention and patient management. Not many studies to date have documented hepatic involvement in chikungunya infection. The development of a rapid, multiplex reverse transcription polymerase chain reaction (M-RT-PCR) for differential diagnosis of dengue and chikungunya infections and analysis of liver enzyme profiles of chikungunya patients, to evaluate the impact of infection on liver biochemical tests. All specimens (EDTA blood) from patients with suspected clinical diagnosis of dengue (n=186) and chikungunya (n=145) referred to the Molecular Diagnostic Laboratory at the Durdans hospital from June 2007 to May 2008 were tested by dengue specific and chikungunya specific RT-PCR for dengue and chikungunya viral RNA respectively (Rs. 2950.00 per one assay). A cost effective M-RT-PCR test (Rs. 2480.00) was also developed and evaluated (n=50) for rapid differentiation of the two viral infections. Of the 186 suspected dengue patients tested, 28 (15%) were positive for dengue viral RNA. Of the 145 suspected chikungunya patients tested, 64 (44%) were positive for chikungunya RNA. The test results of 50 samples analyzed with M-RT-PCR (sensitivity 100 copies/ml) and dengue and chikungunya specific individual RT-PCR assays were in 100% agreement (all samples that became positive with respective individual RT-PCR assays also yielded positive results with M-RT-PCR assay). M-RT-PCR also revealed that 5 patients referred for dengue specific RT-PCR testing were negative for dengue RNA but positive for chikungunya RNA, highlighting the importance of differential diagnosis. An elevation in the level of the liver enzymes SGPT and SGOT was observed in 12 and 19 chikungunya RNA positive patients respectively. Eight patients had both enzymes elevated and the 10 patients had normal levels of both enzymes (<35 for SGPT; <34 for SGOT). The level of SGOT (40-100 U/L) was higher than that of SGPT (35-82 U/L) and the elevation of enzymes was mild in most cases (< 3-fold greater than the normal upper limit). M-RT-PCR is a cost effective rapid method for differential diagnosis of dengue and chikungunya infections. A significant proportion of chikungunya infected patients had evidence of mild to moderate liver damage.

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