

Dengue NS1 Antigen Level: A Potential Tool for Predicting Disease Severity in ER

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Abstract

Dengue is one of the leading causes of mortality amongst seasonal arboviral diseases in the Indian subcontinent. The Clinical manifestations of dengue vary from mild febrile illness to life threatening dengue shock syndrome with polyserositis and severe hemorrhagic tendencies. There is also a variability in presentation in different areas of endemicity and between specific age groups. whereas predictors of outcome have remained controversial. To understand the antibody responses to dengue nonstructural 1 (NS1) glycoprotein and its role in protective immunity or pathogenesis of dengue fever (DF) and dengue hemorrhagic fever (DHF), we have analysed the NS1-specific IgM, from patients with DF and DHF. The morbidity and mortality of DHF can be reduced by early hospitalization and careful supportive care.

Circulating NS1 has been detected in acute-phase serum samples of patients with DV infections. The goals of this study were to determine whether plasma levels of NS1 correlate with severity of dengue in terms of shock, hemorrhagic manifestations, polyserositis, ARDS, need of intensive care and duration of hospital stay. In addition to the end result in terms of Mortality and residual disability.

Keywords: Antigen; Fever; Hypotension; Shock; Serology.

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Methodology

This being a prospective observational study, wherein specified data was collected from the computerized patient record system. The patients were followed during the duration of hospital stay and necessary parameters noted for statistical analysis. We recruited 300 patients for the study purpose. Patients presenting with symptoms of dengue and testing positive for NS1 antigen were enrolled into the study and followed prospectively.

Study Design

Prospective observational study with an 'n' number of 300

Inclusion Criteria

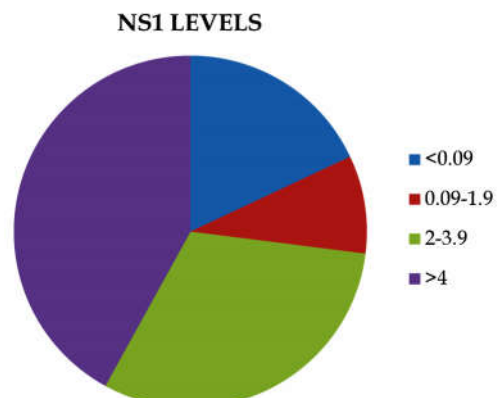
Age - All age groups

Both genders

NS1 levels > 0.09 (Normal Levels <0.09)

NS1 Level Distribution

NS1 LEVEL <0.09, 0.09-1.9, 2-3.9, > 4



Results and Discussion

Previous studies with Dengue NS1 glycoprotein have shown that high circulating levels of dengue virus antigen correlate with the development of dengue hemorrhagic fever, additionally it has been shown that early detection of complications significantly reduces dengue mortality and morbidity.

Circulating NS1 levels have been consistently associated with developing severe dengue. Based on the results of our study it was found that of a total of 300 patients seen in the emergency dept of the study hospital ER, 42 % had high circulating levels of NS1 (>4), these patients had other clinical manifestations in the form of tachycardia, hypotension, and thrombocytopenia, and the need for supportive measures in the form of vasopressor support, need for repeated transfusions, Prolonged duration of ICU stay and increased mortality rates.

In patients with NS1 levels varying from 2 to 4 (31 %) the clinical parameters were observed to be much stable as compared to the first group with less propensity to develop complications and the need for supportive therapy. The duration of hospital stay was also lesser in this group with significantly low mortality rates.

Patients with NS1 levels 0.09 to 1.99 were the ones with the lowest complication rates. The baseline clinical parameters also showed little or no variation among this group. In hospital morbidity amongst this group was significantly lower as compared to the other groups with few patients requiring in hospital

stay, as compared to 100% in the other groups of patients with higher NS1 levels.

Based on the results it can be inferred that the patients with NS1 levels of 2-4 or more have significantly increased morbidity and mortality rates with a rapid course of disease progression.

The early recognition of disease severity based upon NS1 levels can serve as a potential tool for screening dengue patients, since the initiation of definitive, supportive measures early in the course of the disease can significantly reduce the complication rates improving patient survival and disease outcome.

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