

# Economic burden of dengue and the clinical use of on-admission atypical lymphocyte counts for reducing the overall financial burden

Visula Abeysuriya<sup>1</sup>, Sanjay de Mel<sup>2</sup>, Chandima de Mel<sup>1</sup>, Lal Chandrasena<sup>1</sup> and Suranjith L Seneviratne<sup>1</sup>

Nawaloka Hospital Research and Education Foundation<sup>1</sup> and National University Health System Singapore<sup>2</sup>

## Introduction:

Dengue is a mosquito-borne disease that occurs in many countries. Its incidence has increased markedly during the past three decades and results in a high health and economic burden. On admission atypical lymphocyte counts (ALC) are significantly associated with dengue severity.

## Objectives:

We assessed the economic burden of dengue and evaluated the use of ALC as an early predictive marker for reducing the financial cost to the patient.

## Methods:

- Information was prospectively collected on patients admitted to Nawaloka Hospital (NH), Sri Lanka with Dengue infection [DI] between January 2014 and May 2019.
- DI was diagnosed based on a positive Non-structural antigen 1 (NS1) or dengue IgM antibody result. ALC (absolute and percentage) data were extracted from the Sysmex XS500i automated full blood count (FBC) analyzer (Sysmex Corporation Kobe, Japan).
- Dengue severity was classified according to WHO 2009 guidelines.
- Financial data was recorded from billing records and the computerized data base maintained by NH.
- P values of <0.05 will be considered significant. Ethical approval was obtained from NH ethics committee.

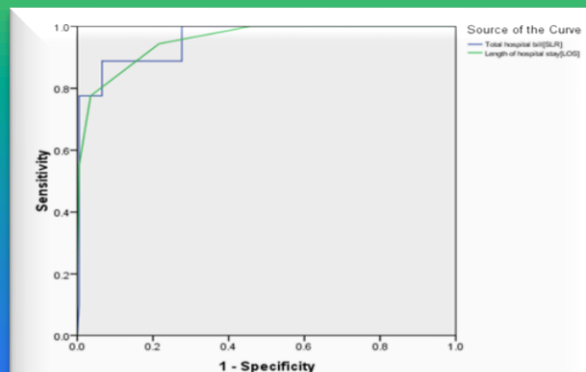
## Results:

- The study sample consisted of 2285 confirmed dengue patients. Females [51.9%], and mean age was 30.5±15.8 years.
- Based on linear regression analysis severity of dengue [p=0.001], length of hospital stay more than 5 days [p=0.001] and availability of insurance scheme [p=0.001] were significant predictive factors for the final hospital bill.
- Based on ROC analysis on-admission AL count more than 0.5 [103] were strong factor for predicting a hospital stay more than 5 days and total hospital bill of more than SLR 132000 (Sensitivity=94.4% and Specificity=78.4%).

**Table 1: Predictive factors of total hospital bill of dengue patients.**

Variable	B coefficient	IQR(25th to 75th )	Significant*
Severity of dengue-sever dengue	181,948.78	169523.39-194,374.18	0.001
Length of hospital more than 5 days	102,635.67	96,777.96-108,493.39	0.001
Availability of insurance scheme	17,644.8	13,465.73-21,823.87	0.001

**Figure 1: On admission (day 3 following fever) AL count more than 0.5 [103] as a predictive factor for patient's hospital stay more than 5days and total hospital bill more than SLR 132000.**



## Conclusions:

- Dengue severity and length of hospital stay are major contributing factors to the total hospital bill.
- On admission ALC can be used as a prediction tool for estimating length of hospital stay and total hospital bill.
- Early discharge of patients with low ALC would reduce overall financial burden.