Clinical profile of dengue in a hitherto non-endemic region—A hospital based study from northeast India

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ABSTRACT

Background: Global burden of dengue is substantial, with an annual incidence of 50 million cases. India has witnessed gradual rise in its incidence, mainly from urban regions. North-eastern India, hitherto non-endemic for dengue, has reported sporadic cases of dengue lately.
Objective: To study the clinical profile of dengue in north-east India.
Method and material: Clinical profile of 218 dengue patients ($\geq$15 years) was studied in a hospital-based observational study. Dengue was diagnosed by WHO criteria and confirmed by NS1 antigen and/or dengue specific IgM ELISA tests. Statistical analyses were done using SPSS and STATA Data analysis and statistical software. A 'p value' <0.05 was considered significant.
Results: There was male preponderance (58.7%), affecting mainly younger (15–34 years) subjects (73.85%). Majority (96.33%) were without travel history, none had dengue previously. Serological confirmation was present in 77.06%. On admission, mean haemoglobin and platelet counts were low with normal leucocyte count and haematocrit. Platelet and leucocyte counts declined during hospital stay; 8.25% developed severe thrombocytopenia ($<10000/mm^3$) necessitating platelet transfusion, 17.43% developed leukopenia. Systemic hypotension was found in 13.3%. Mortality was nil and average hospital stay was 5.36 days.
Conclusion: First attacks of dengue without travel history, in a hitherto non-endemic region suggest recent endemicity.

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1. Introduction

Dengue is a systemic arbo-viral infection transmitted between humans by the *Aedes aegypti* and *Aedes albopictus* mosquitoes. The global burden of dengue is substantial, with nearly 50 million cases occurring annually in over a hundred countries worldwide [1]. Further, an estimated 500,000 people with severe dengue require hospitalization, with a mortality of 2.5% [2]. The endemicity of dengue infection has spread to large parts of the world with severe forms as well as other unusual manifestations of the disease being reported from previously unaffected regions[3]. While the classical form of dengue fever has been more common in adults, the severe forms have been more common in children [3]. However, with the change in the epidemiology of the disease, an increasing number of severe dengue infections is being reported in adults worldwide [4].

In India, the first documented epidemic of dengue was reported in Calcutta in 1963–64 [5]. Since then there has been gradual rise in the incidence from various pockets, mainly urban and this geographical spread is consistent with the unplanned urbanization across the country. Data from the Ministry of Health and Family Welfare has cited an incidence of 40,571 dengue cases with 132 deaths in 2014 alone [6]. However, the actual burden may be as high as 33 million cases annually as many cases are not reported [7].

The north-eastern region (NER) of India is mostly semi-urban and rural and climatically cooler, lying in the temperate zone.

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Reports till the last decade suggest that this region of India has not been endemic for dengue with only few reports of sporadic cases, found mainly in travellers from endemic region [8]. However, over last few years, there has been a gradual rise in the incidence of dengue from this region of India [6], consistent with the rapid and unplanned urbanization of the peri-urban regions in the NER. Whether, this rise in incidence is due to travel to other endemic regions and imported cases, or an actual rise in the endemicity of the disease in this NER is not well ascertained.

The published literature on dengue from the NER of the country is scarce. In this background we conducted a study on the burden and clinical profile of patients with dengue fever admitted to a large tertiary care teaching hospital in north-east India, which caters to the population of this region.

2. Method and material

The present study was a hospital-based prospective, analytical observational study, carried out between June 2013 to November 2013 in all consecutive patients with clinically suspected dengue fever, and satisfying selection criteria, admitted to the department of general medicine of a large tertiary care hospital in Guwahati, the largest city of north east India.

Dengue was clinically diagnosed using the criteria recommended by WHO which defines dengue as a case of acute febrile illness of two to seven days duration with two or more of the following manifestations: headache, retro-orbital pain, myalgia, arthralgia, vomiting, rash, haemorrhagic manifestations and leucopenia [9].

2.1. Inclusion criteria

All patients above the age of 15 years with the clinical diagnosis of dengue were included [9].

2.2. Exclusion criteria

Patients with other co-infections like malaria, enteric fever, scrub typhus and bacterial sepsis were excluded from the study.

All selected patients were subjected to a thorough clinical history and examination and a structured performa was filled in for each case. Laboratory investigations including complete blood counts, urine analysis, blood urea, serum creatinine, blood glucose, liver function tests, chest x-ray and ultrasonography of abdomen were done in all cases. For serological diagnosis, serum samples were tested for presence of dengue viral non-structural 1 (NS1) antigen and for dengue specific immunoglobulin M (IgM) antibody by using IgM antibody capture enzyme-linked immune-sorbent assay (MAC-ELISA). Cases of malaria, enteric fever, scrub typhus
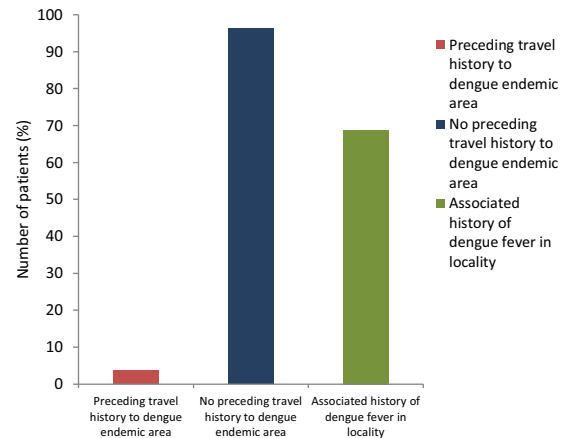

Fig. 2. Preceding travel history to dengue endemic region and history of dengue fever in the locality of the dengue patients.

and sepsis were excluded depending on results of rapid diagnostic tests for malaria, widal test and blood culture for enteric fever, immunochromatographic test for scrub typhus and peripheral blood counts with site specific cultures for bacteriological sepsis respectively.

Ethical clearance was taken from the Institutional Ethical Committee and written informed consent was taken from all the patients included in the study.

2.3. Statistical analyses

Statistical analyses were done using Statistical Package for Social Survey (SPSS) and STATA Data analysis and statistical software for Windows version 17.0. The results were tabulated and graphically represented using Microsoft Office for Windows 2008.

3. Results

Based on the selection criteria a total of 218 patients were included in the study of which 128 were male and 90 female, with a male to female ratio of 1.42:1. Majority of the cases belonged to the age group of 25–34 years (38.53%) followed by those of 15–24 years (35.32%) (Fig. 1). Prior history of travel to dengue endemic zones within the preceding 4 weeks was present in only 3.67% of the patients. In more than two-thirds (68.81%) of the patients, there was history of dengue fever in their locality of residence (Fig. 2).
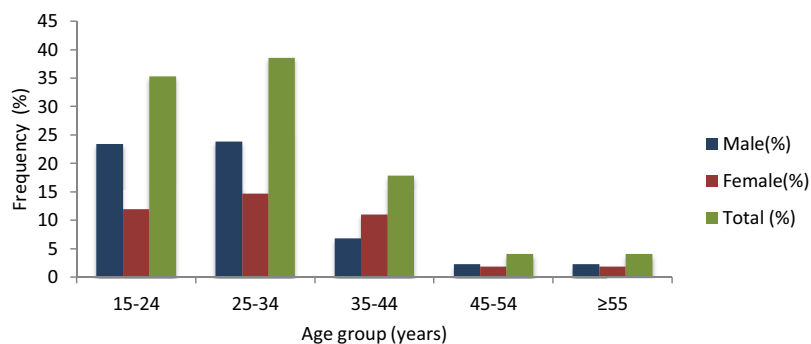

Fig. 1. Age and sex distributions in dengue patients.