

Clinical observations among patients with Dengue Fever in Nepal

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Abstract

Introduction: Dengue is an arthropod-borne viral illness that has become a serious public health threat in Nepal. The disease has been reported frequently during the post monsoon period in the southern lowlands of the country. Studies relating to sero-prevalence of dengue have been performed regularly in Nepal but the most frequent clinical observations among the patients with dengue fever have not been well documented. We report thrombocytopenia (74%), headache (44%) and myalgia (44%) among the febrile cases as the most frequent features of the 287 dengue cases identified by rapid immunochromatographic tests and ELISA during 2010 and 2011. These findings are potentially helpful for the clinicians to predict dengue in the early stage in those areas where dengue has been endemic, thus minimizing the significant morbidity and mortality of the disease.

Keywords: Dengue, disease, clinical features, Nepal.

Introduction

Dengue fever (DF) is currently one of the most important mosquito-borne viral illnesses caused by any of the four serotypes of dengue virus (DENV 1-4) belonging to the genus *Flavivirus* and family *Flaviviridae*^{1,2,3}. It is transmitted to humans by the bite of infected female *Aedes aegypti* or *Aedes albopictus* mosquitoes⁴. The infection can be sub-clinical or it may cause dengue fever or severe dengue⁵. Early clinical features of dengue infection are variable among patients, and initial symptoms are often non-specific⁶. DF is usually a self limiting illness with significant morbidity but low mortality if treated properly⁶. However, severe dengue has greater risk of complications including severe plasma leakage that leads to shock and/or fluid accumulation with respiratory distress, severe bleeding and severe organ impairment⁵. Management of life threatening, severe cases that occur during critical phase is a major medical problem; however, specific treatment for dengue is still unavailable.

Dengue is a climate sensitive vector-borne illness that has been transmitting in the tropical and sub-tropical parts of the world⁷. The disease has emerged to become one of the

major public health problems in the South-East Asia together with Western Pacific region¹. Dengue has been considered to be a possible public health threat to Nepal because dengue epidemics have occurred frequently in India and other nearby South Asian countries. The southern, eastern and western belt of Nepal is geographically surrounded by India, which has already experienced several epidemics of dengue in the past³. The trans-border movement of the people between Terai region of Nepal and northern states of India where dengue is endemic causes a higher risk of dengue transmission⁸. In Nepal, the first dengue case was reported from expatriate who returned from Vietnam in 2004 residing in Chitwan⁹. But, first dengue infection was determined on the basis of serological investigation¹⁰ among Nepalese population in southern-west terai region during outbreak of Japanese encephalitis. Since then, the cases have been increasing in number and geographical areas. In 2006, the disease was reported in 9 districts whereas in 2010 outbreak, it was reported in 24 districts with severe cases and some deaths¹¹. It clearly suggests that DENV has been circulating in Nepal for several years.

Nepal has less efficient dengue surveillance programs and clinicians usually face diagnostic dilemma between dengue and other infections such as influenza, leptospirosis, malaria, typhoid fever and viral hemorrhagic fevers because the clinical manifestations mimic among these conditions. Dengue is itself a newly emerged disease in Nepal and clinicians not being exposed to the disease so often; do not entertain dengue as a differential diagnosis. Although most of the studies in the past have been performed to assess the sero-prevalence of DENV,¹⁰ a very few have attempted to analyze the most frequent clinical features among the patients in Nepal. We sought to identify the early clinical features constituting a specific profile of DF which could help to diagnose dengue at primary health care level using clinical criteria and basic laboratory parameters. The sample collection was carried out at various hospitals of the country during July-December, 2010 and August-November, 2011 (Figure 1).



Figure 1: Districts where sampling was carried out.

Any suspected case based on WHO guidelines⁵ was tested by rapid diagnostic test (Standard Diagnostics Inc., Korea) at the hospital and further the samples were confirmed by dengue specific IgM Enzyme Linked Immunosorbent Assay (Standard Diagnostics Inc., Korea) at Everest International Clinic and Research Center (EICRC), Kathmandu. Subjects with previous Japanese encephalitis immunizations were excluded from the study, thus minimizing the false positives due to cross reactivity. Serologically dengue infection was confirmed in 287 febrile samples with headache and myalgia being the most common clinical features, followed by abdominal pain, nausea and anorexia. Similarly, thrombocytopenia and leucopenia were the most common hematological features (Table 1).

Table 1: Clinical and hematological features of dengue cases.

Symptoms	2010 No.	2011 No.	Total No. (%)
Clinical features			
Headache	106	20	126 (44)
Myalgia	104	21	125 (44)
Skin Rash	28	4	32 (11)
Anorexia	25	22	47 (16)
Retro-Orbital Pain	31	2	33 (11)
Nausea	42	15	57 (20)
Diarrhoea	9	3	12 (4)
Abdominal Pain	59	10	69 (24)
Hematological features			
Leucopenia	73	8	81 (28)
Thrombocytopenia	197	14	211 (74)
Total	262	25	287

Though the clinical findings alone are not sufficient to make an accurate diagnosis of DF as several other infectious diseases may present with similar findings, these findings can be suggestive for the early screening of DF. Clinical and hematological tests are easy to perform and feasible in rural hospital settings. The cases can later be detected by serological and molecular techniques. Viral isolation and detection of viral antigens or RNA in tissue or serum are not commonly used in Nepal due to poor laboratory infrastructure. The diagnosis of suspected DV infection has been heavily relied upon rapid diagnostic test during outbreaks. Despite widespread use, these tests have low sensitivity and cross react with other flavivirus infections, which may lead to false positive results¹². So, clinical and hematological features are equally important for the clinicians in dengue diagnosis.

Although the suspected cases were defined according to the WHO guidelines, we could have missed some patients during our study period. A few samples were missed due to the failure in sample collection. The major limitation of

the study was the use of single serum for ELISA instead of paired sera. Further, the transportation of the samples before serological testing might have damaged their biological properties. Other limitations included the unavailability of virological and molecular testing of the samples.

To the best of our knowledge, the clinical features among the patients during the critical phase have not been reported in Nepal. Because the disease has been expanding geographically and the country bearing its first outbreak in 2010, it's high time that such features be well documented and national guidelines for dengue diagnosis in poor hospital settings be set up so that the disease could be diagnosed at an early stage reducing the possibilities of severe complications during the critical phase.

Conflict of interest: None declared.

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