ORIGINAL ARTICLE

PATTERN OF PRESENTATION AMONG ADULTS HOSPITALIZED WITH DENGUE DISEASE

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Background: Dengue is a mosquito born viral infection that has rapidly spread in the world particularly in Southeast Asia. The aim of this hospital based study was to see the demographic, clinical and laboratory characteristics in adults with dengue infection in Hazara region of Northern Pakistan. **Methods**: This is a descriptive study. Clinical, laboratory and demographic information were collected from adult patients with suspected dengue infection (*n*=100) and then managed in one of medical units of tertiary care hospital in Abbottabad from August to October 2015. **Results:** Total number of patients was 100, 78 were male and 22 were female. 49 patients were in age group from 21 to 40 years. Most patients were from Mansehra district (69), followed by Haripur (11), Abbottabad (11), Battagram (06) and Kohistan (03). Common clinical features were fever (100%), body aches (95%), headache (94%), chills (87%), and anorexia (86%), haemorrhagic tendencies (12%), rash (05%), and sore throat (03%). Thrombocytopenia was observed in 98%, leucopoenia in 25%, high Aminotransferases (ALT) in 67%, Ns1 antigen positive 66%, negative 18% and unknown 16%. IgM Antibodies against Dengue Virus was positive 67%, negative 19% and were unknown in 14%, IgG antibodies positive in 54%, negative 32% and were unknown in 14%. **Conclusion:** We concluded in our study that presentation of dengue infection is same as in other Southeast Asian countries; however, the disease is more prevalent in cities located on plain than hilly areas.

Keywords: Dengue; *Ades Aegypti*; Fever; Pattern; Clinical features; Laboratory; Characteristics; Hazara Region

J Ayub Med Coll Abbottabad 2017;29(3):432–5

INTRODUCTION

Dengue viruses belong to the family Flaviviridae, having four serotypes DV-1, DV-2, DV-3, and DV-4. All four serotypes can cause the full spectrum of disease from a subclinical infection to a mild self-limiting disease, the dengue fever, and the dengue haemorrhagic fever/dengue shock syndrome, which is a severe complication and may be fatal.

A century ago, dengue was a sporadic disease that caused epidemics at long intervals, today dengue ranks as the most important mosquito-borne viral disease in the world, according to WHO report, in the last 50 years, incidence has increased 30-fold. Up to 50 million infections occur annually with 500 000 cases of dengue haemorrhagic fever and 22,000 deaths mainly among children.[1] The first confirmed outbreak of dengue fever in Pakistan was in 1994[2], and the first largest epidemic of dengue fever was reported in 2006[3] in Karachi. Since 2010, Pakistan has been experiencing an epidemic of dengue fever that has caused 16580 confirmed case and 257 deaths in Lahore and nearly 5000 cases and 60 deaths reported from the rest of the country. The three provinces facing the epidemic are Khyber Pakhtunkhwa, Punjab, and Sind. Currently, there is no licensed vaccine or antiviral drugs available for the prevention and treatment of dengue disease. Diagnostic tests such as antibodies by Elisa and PCR are not available in this area. Moreover, clinical features of dengue are indistinguishable from other infectious disease such as malaria chickengunya, rickitsia, and leptospira. The only way is to diagnose the disease early with the help of clinical features and simple laboratory tests. Like elsewhere in Pakistan, we also get a large number of cases of dengue fever in Ayub Teaching Hospital (ATH) from August to October, the time matching the rainy season. ATH is a referral centre for five districts of Hazara region including Haripur, Abbottabad, Mansehra Battagram, and Kohistan. During the year 2015, there was an epidemic; almost 30-40 % of the ward beds were occupied by the dengue disease patients. There were large number of cases from periphery which were unreported. Early diagnosis and prompt institution of treatment is vital to prevent morbidity and mortality. Unfortunately, due to lack of specific tests, the diagnosis of dengue disease is based on clinical presentation, laboratory abnormalities, and nonspecific serological tests. The study was undertaken to evaluate common clinical features and laboratory abnormalities of dengue disease in order to enable the treating physician to recognize and manage the disease efficiently.

MATERIAL AND METHOD

This is a descriptive study carried out in one of the three medical units of Ayub Teaching Hospital, Abbottabad. All adult patients above 15 years of age with clinical features suggestive of dengue infection were included.

Patients with specific identifiable cause of fever such as malaria, typhoid, and viral hepatitis were excluded from the study. Study period was from July to October 2015. On admission, initial bio data including name, age, sex, address, was recorded. Detail history and clinical examination was performed in every patient. Patients were asked about history of fever, headache, retro bulbar pain, body aches, nausea, vomiting, rash and bleeding from any orifice.

Patients were particularly asked about the exact date of onset of symptoms, travel to any other city/country within 14 days of onset of symptoms and previous history of dengue fever. Clinical examination was performed to look for lymphadenopathy, hepatosplenmegaly, rashes and bruises. Blood samples of each patient were collected and sent to laboratory for Haemoglobin, Total leukocyte count (TLC), Haematocrit (Hct), Platelet count, Renal function tests, serum bilirubin, Aminotransferases (ALT), Serum albumin, Serum total protein, Prothrombin time (PT) and activated partial thrombin test (APTT). Platelet count, TLC Hct. was monitored daily. Serum samples were also sent for detection of dengue-virus- specific Ns1 antigen and antibodies IgM and IgG (by rapid strip tests). The result was recorded according to which day from the date of onset of symptom it was positive or negative. For IgM, negative results before day 4 were repeated again for seroconversion. In case of IgG, result before day 6 was recorded as unknown. Where indicated, ECG, Chest X-Ray and ultrasound were also performed. Patients with evidence of serum leakage were managed with I/V fluids and those with evidence of bleeding were given platelet concentrates. On stabilization of clinical and laboratory parameters, the patient was discharged from the hospital. All clinical and laboratory data was recorded on a Performa specially designed for this purpose and then entered and processed in SPSS system version 16.

RESULTS

Total numbers of adult patients in this study were 100, 78 (78.00%) were males and 22 (22.00%) females. Their age in groups and sex distribution is as shown in table-1. Table 2 shows district and table 3 shows city wise distribution of cases. Sixty-nine (69.00%) patients belonged to urban and 31 (31.00 %) belonged to rural setting. 78 % had fever at the time of admission while 100% patients had history of fever during the course of illness. Other common clinical features are shown in table 4.

Only 02(2.00 %) patients had normal platelet count (150000–450000). Sixty-four (64.00 %) patients had normal TLC count (4000 to 11000), 25 (25.00%) less than 4000 and 11 patients (11.00%) had more than 11000 TLC count

Sixty-seven (67.00%) patients had high ALT (40 or more). Antigen Ns1 positive cases were 66 (66.00%), negative 18 (18.00%) and unknown 16 (16.00 %). Antibody IgM was positive in 67 (67%), negative in 19 (19%) and unknown in 14 (19.00%) cases. Antibody IgG was positive in 54 (54.00%), negative in 32 (32.00%) and unknown in 14 (14.00%) cases.

Table-1: Age and sex distribution

Age groups	Frequency	Sex	
		Male	Female
20 or lower	19 (19.00%)	16	03
21–40	49 (49.00%)	42	07
41–60	28 (28.00%)	18	10
More than 60	04 (04.00%)	02	02
Total	100	78	22

Table-2: Frequency-district wise

District	Frequency	Percent
Mansehra	69	69.0
Haripur	11	11.0
Abbottabad	11	11.0
Battagram	6	6.0
Kohistan	3	3.0
Total	100	100.0

Table-3: Frequency- city wise

City	Frequency	Percent
Abbottabad	6	6.0
Mansehra	59	59.0
Battagram	4	4.0
Allai	2	2.0
Kohistan	3	3.0
Ogi	4	4.0
Havelian	5	5.0
Haripur	10	10.0
Shinkiari	2	2.0
Balakot	4	4.0
Sirikot	1	1.0
Total	100	100

Table-4: Frequency of signs and symptoms with dengue fever

Symptoms	Frequency	Percentage
Fever History	100	100
Fever Now	78	78
Travel to another city	15	15
Haemorrhage (nasal, Gums, Petechias)	12	12
Mucosal Bleed or haematuria etc	87	87
Chill	94	94
Headache	94	94
Rash	05	05
Previous h/o dengue fever	01	01
Eye Pain	47	47
Body Ache	95	95
Joints Pain	54	54
Anorexia	86	86
Vomiting	03	03
Abdominal Pain	13	13
Lethargy	26	26
Hepatomegaly	01	01
Pleural Effusion	02	02
Diarrhoea	03	03
Cough	06	06
Conjunctivitis	02	02
Sore Throat	03	03
Jaundice	02	02
Convulsion	01	01

Table-5: Platelets categories (Per Micro litter)

Platelets count (Categories)	Frequency	Percent
Less than 10000	4	4.0
10000–50000	58	58.0
50000–100000	31	31.0
100000–150000	5	5.0
150000–450000	2	2.0
Total	100	100.0

DISCUSSION

Regular epidemics of dengue fever are occurring in the past six years in Pakistan and number of studies has been published in the literature to highlight the various aspects of this challenging problem.[4–6] Like elsewhere in Pakistan we also get a large number of cases of dengue disease in Hazara region with significant morbidity and mortality. However, there is no study carried out yet to tell anything about the prevalence and natural history of this disease in term of clinical presentation and outcome in our area. This study, although not conducted at a large scale, partly reflect the magnitude of the problem, geographic distribution; clinical behaviour of the disease and its outcome in this area.

The study was carried out from August 1 to October 31 of year 2015. Majority of patients in our study were from peri-urban slum (69%) that indicates favourable breeding places for mosquitoes because cities are located on plains and there are more chances of water stagnation. More over the practices for water storage for domestic use are not proper and there is inadequate disposal of wastes owing to overcrowded population and poor management. In contrast, the rural population is sparse and there are less chances of water stagnation owing to gravity dependent drainage.

The commonest affected district was the district of Mansehra (69% cases) in our study and maximum cases (59) were reported from Mansehra city than its attached villages, probably the reason is that city area is thickly populated and situated mostly on plain. The least affected districts were that of Kohistan (3%) and Batgram (6%). The latter two districts are hilly; their climate is cool and population sparse thus making the environment unfavourable for mosquito breeding and disease transmission. This finding clearly indicates how the living conditions, geographic nature of the locality and climate has important bearing on the total disease burden.

Majority of the sufferer were males (78%), the incidence was high (77%) in the age group from 21–60 years a finding consistent with other studies.[7] This may be due to the fact that males of this age group are engaged in outdoor activities and are more exposed to the risk factors for transmission of disease.

Fever (100%) was the commonest symptom, a similar finding was observed in other studies carried out in adults and children in Southeast Asian countries.[8] However, other symptoms such as body aches (95%), headache (94%), chill (87%) and anorexia (86%) were more common in our case but were less frequent in those studies. Haemorrhagic tendencies (nose bleed, ecchymosis, haematuria, GI bleed etc.) occurred in 12% of cases, however, no fatality resulted, and all patients survived of this complication. Hepatomegaly, pleural effusion, and ascetic were rare. We did not come across any patient with bimodal presentation of fever as sometime is seen in dengue infection.

At the time of presentation, thrombocytopenia (Platelet count less than 150000) was observed in 98% of our patients and most patients (58%) were having count from 10000 to 50000. Although thrombocytopenia is a very common and recognized feature of dengue infection[9,10] but such high frequency may be due to selection bias as it was used one of the criteria for hospitalization in our case. Leucopenia (less than 4000) was observed in 25% while high alt (40 and above) was seen in 69% of cases. This finding is consistent with other studies which also show high alt.[11] However, serum bilirubin remained normal in most of these patients.

Ns1 dengue antigen was positive in 66, negative in 18 and unknown in 16 patients (the results are calculated in sum total from day 1 to 5). The reason for unknown result was the late presentation of the patient as Ns1 positivity rate is high within 5 days from the date of onset of symptoms. The test was performed with rapid kit strips and a number of comparative studies (with Elisa) revealed that the sensitivity and specificity of rapid kit strips are as high as 98.9% and 90.6% respectively.[12,13]

IgM (performed with rapid kit strips) were positive in 65 (65%) patients and among these 50 (76.92%) patients turned positive within day 4–6. The same finding was reported in his study by Stefen Schilling (in journal of clinical virology 2004) from Germany[14] that in primary dengue IgM detection rate was 55% and 94% during days 4–7 and after day 7 respectively. We had less number of cases positive during day 7 and onward because of short hospital stay.

The reason for less number of positive serology (54%) in case of IgG is early discharge of patients from hospital; detectable serum concentration is achieved 10 days after disease onset. Mean hospital stay was 3.09 days, all patients recovered except one who died of haemorrhage from

multiple sites, capillary leakage and liver failure. This patient had secondary dengue (primary in 2014).

The study shows that except slight differences in prevalence clinical features, of dengue infection was same as in other epidemics in Southeast Asia. However, the disease was more common in cities located on plain than the hilly population where it was rare. This finding is helpful to the local health authorities to implement effective control program to prevent such outbreaks in future.

Our study had number of shortcomings, population sample studied was small hence prevalence of disease cannot be calculated, serological results of few patients remained unknown because of short hospital stay (inflow of patients was high, they had to discharge early) and lastly non-availability of specific diagnostic tests.

AUTHORS' CONTRIBUTION

AR: Study conception, methodology, formal analysis & manuscript preparation. NHSK: Study conception, supervision & project administration. HZ: Provision of study material, investigations & data collection. SG: Critical review. T, FM & S: Computation, data collection & curation.

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Received: 29 December, 2016	*Revised: 30 April, 2017*	*Accepted: 21 May, 2017*

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