ORIGINAL ARTICLE

Trends of Clinical Symptoms and Haemotological Profile of Dengue Fever among Hospitalized Patients at Sir Ganga Ram Hospital, Lahore

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ABSTRACT

Objectives: To determine the trends of clinical symptoms and haematological profile of dengue fever in order to assess the severity of disease

Study design: An open label prospective observational study.

Setting: The study was conducted at department of medicine, Sir Ganga Ram Hospital, Lahore.

Timing: For a period of two years from January 2007 to January 2009.

Method: Among 2000 patients who presented with fever were screened for dengue fever, 1330 patients turned out to be positive for dengue fever and 302 patients with clinical manifestations and hematological abnormalities were hospitalized. Analysis of frequency of symptoms and hematological profile was done in these patients to identify the predictors of disease severity.

Results: The clinical symptoms and signs of dengue fever were fever (100%) followed by headache 84.76% and arthralgia (82.45%). Appearances of cutaneous signs such as maculopapular rash and flushing were observed in 71.85% of patients, nausea and vomiting (40.72%), jaundice (25.83%) and retro-orbital congestion [25.83%]. Hemorrhagic manifestation was seen in 14.90 % of patients manifested as petechial rash, per-rectal bleeding, epistaxis, sub-conjunctival bleeding and gum bleeding. Thrombocytopenia was seen in 100% of patients and leukopenia was observed in 80.13% of patients. Abnormal liver function tests were detected in 60% of patients. Three patients expired, one patient having underlying complicated diabetes and ischaemic heart disease, second was 70 years old male with raised liver enzyme with no sign of bleed. Third patient was 54 years old female having sever thrombocytopenia and bleed.

Conclusion: There are definite trends of symptoms in relation to defeverscence of fever. Headache occurs early and bleeding symptoms occur much later. The clinical manifestations and haematological abnormalities serve as useful predictors for the assessment of severity of dengue fever and mortality is less than 1%.

Key words: Dengue fever, clinical manifestation, Haematological profile

INTRODUCTION

Dengue fever, the most common arboviral illness transmitted worldwide, is caused by one of four closely related but antigenically distinctive virus serotypes DEN-1, DEN2, DEN-3, and DEN-4[1,2]. Dengue viruses are small, spherical single stranded enveloped RNA viruses of the family Flaviviridae, genus Flavivirus[3]. Dengue is transmitted by mosquitoes of the genus Aedese aegypti[4]. Infection with dengue viruses produces a spectrum of clinical illness ranging from non-specific viral syndrome to severe Haemorrhagic disease[5]. Infection is asymptomatic in 80% of infants and children. The incubation period of virus is 3-15 days (usually 7-10 days). After an incubation period of 4-5 days, there is a sudden onset of high fever, chills and ' break bone' aching of the head, back and extremities accompanied by sore throat, malaise and prostration. There may be conjunctival redness and flushing or blotching of skin[2,4,5,6]. Hepatitis frequently complicates dengue fever[4,7]. Dengue Haemorrhagic fever is characterized by acute fever, Haemorrhagic manifestations and marked capillary leaking the latter manifesting as pleural effusions, ascites and a tendency to develop shock. The common manifest-tations of dengue Hemorrhagic fever are petechial rash, epistaxis, gum bleeding and gastrointestinal bleeding[68,9]. Eliza can be used to classify dengue virus infection as primary or secondary infection by determining the ratio of units of dengue IgM: IgG antibodies titers[10]. High levels of IgG are indicative of secondary infections. Patients can be divided into two groups according to platelet level[11]. Group A mild disease activity whose platelet count above 50,000/cmm and Group B having severe disease activity whose platelet count below 50,000/cmm[11].

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MATERIALS AND METHODS

This paper describes the trend of clinical manifestations and Hematological findings of 302 hospitalized patients in Sir Ganga Ram Hospital, Lahore. Patients were divided into two groups on the basis of platelet level. The objective of the categorization was to find out the trend of Hematological characteristics of severe disease group from that of mild disease. This open Label prospective Observational Study was carried out in department of medicine Sir Ganga Ram Hospital Lahore; from January 2007 to December 2008.

Inclusion criteria: The patients who fulfill the following criteria were included in study[23]:

- High-grade fever with positive tourniquet test
- Bleeding manifestations
- Thrombocytopenia and leukopenia
- Deranged Hepatic Profile / Increased LFT's
- Haemoconcentration (increase in haematocrit by 20% or more relative to baseline)
- Presence of circulatory failure or profound shock.

Exclusion criteria

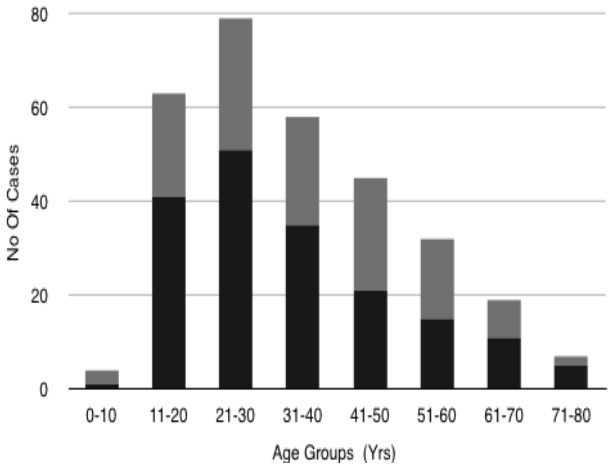
- Patients with symptoms of other causes of fever
- Patient with normal platelet count.

RESULTS

The clinical manifestations and Hematological profile of dengue fever were studied. The frequency of clinical features of dengue fever and the order of appearance of clinical features were analyzed. Total numbers of patients screened for dengue fever were 2000, out of which 1330 patients turned out to be positive for dengue fever. Only 302 patients with clinical symptoms and Haematological abnormalities were hospitalized. Out of 302 patients 20 (6.62%) were having only IgG positive and rest were having IgM 282 (93.37%). Patients were divided into two groups according to their platelet level. Group A (mild disease activity) was defined as the group of patients whose platelet count above 50,000/cmm seen in 37% of patient. Group B (severe disease activity) was defined as the group of patients whose platelet count below 50,000/cmm seen in 63% of patients. Among 302 patients male were 178(59%) and 124(41%) were female. Predominant Age Group was between 20-50 years and the average age was 35 years with a wide range from minimum of 8 years to maximum 80years as shown in table 1.

The clinical symptoms and signs of dengue fever were fever (100%) followed by headache 84.76%, arthralgia (82.45%), Appearance of cutaneous signs such as maculopapular rash and flushing were observed in 71.85% of patients, nausea and vomiting (40.72%), jaundice (25.83%) and retro-orbital congestion(25.83%). Hemorrhagic manifestation was seen in 14.90 % of patients manifested as petechial rash, per-rectal bleeding, epistaxis, sub-conjunctival bleeding and gum bleeding.

Table 1: Frequency of risk factors according to gender.



Gray: Female Black: Male

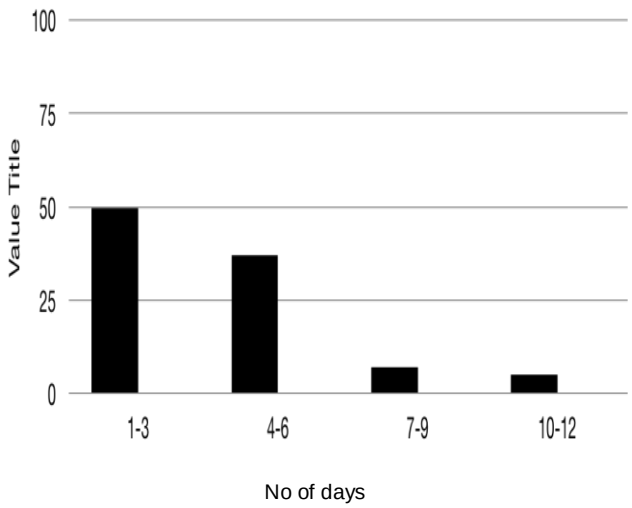
Haematological profile of dengue fever was analyzed among hospitalized patients who showed haemoconcentration, leukopenia and thrombocytopenia. Thrombocytopenia was seen in 100% of admitted patients and leukopenia was observed in 80.13% of patients. Abnormal liver function tests were detected in 60% of patients. All these are shown in table 3.

Table 2: Frequency of symptoms

Fever	302(100%)
Headache	256(84.765%)
Fatigue	250(82.78%)
Arthralgia and myalgia	249(82.45%)
Maculopaular Rash	217(71.85%)
Nausea & vomiting	123(40.72%)
Jaundice	78 (25.83%)
Retroorbital congestion	78 (25.83%)
Haemorrhagic manifestation	45 (14.90%)
Thrombocytopenia	302 (100%)
Leukopenia	242 (80.13%)

The duration of stay of patient population under study revealed 50% of the patients were discharged in first three days with only 3% of the patients stayed for more than 10 days as shown in table 3.

Table 3: The duration of stay of patient population under study .



Among 302 patients three patients expired, one patient having complicated diabetes and ischaemic heart disease, second was 70 years old male with no sign of bleed but raised aminotransferases. Third patient were 54 years old female having sever thrombocytopenia, raised aminotransferases and sign of bleed. Over all mortality is less than 1%.

DISCUSSION

Dengue has become a serious public health problem in the last couple of years in Pakistan. A recent outbreak of Dengue Fever occurred in Karachi in year 2006[12] followed by an outbreak in Lahore. The patients presented in Sir Ganga Ram Hospital Lahore, with features that fit the criteria of dengue fever as per WHO guide lines were included in our study. High level of IgG are indicative of secondary infections[10]. Of 77 patients diagnosed with dengue fever in the united states between 2001 to 2004, 8 (10%) had primary infection and 12(16%) had a secondary infection (for the remaining 57 patients , the distinction was not determined)[13]. Most of our patient were having primary infection 93.377% and only a small minority (6.62%) were having secondary infection.

Fever is most important clinical feature in all cases and has a certain pattern called Saddleback fever: fever abates for a day and then returns[2]. In our observational study at Sir Ganga Ram Hospital, fever was present in all cases (100%) admitted and chills preceded fever. Headache was the earliest symptom observed in 84.77% patients with dengue fever. This means that headache precedes all other symptoms like arthralgia, myalgia (82.45%)and vomiting. Reteroorbital pain is common and often described as severe[2]. Our observation showed reteroorbital pain in 25.83% of cases and was described by the patient on the scale of 1-10 as 8, which may be labeled as severe[14]. Erythematous mottling of the skin and facial flushing: a sensitive and specific predictor. The rash is variable and may be maculopapular or macular. Rash persisted for 3-4 days and disappeared as the fever settled. Patechiae and purpra may develop as a hemorrhagic manifestations[2]. The study taken at Ganga Ram Hospital showed (71.85%) of patients had rash as one of the manifestations and it served as predictor of severity of the disease because it contributed to bleeding tendencies as well. 63 % cases have platelet count below 50,000. Bleeding manifestations were observed in 14.90% patients whose platelet count was below 30,000. Bleeding manifestations were observed 2-3 days before the onset of fever. Amongst the bleeding manifestations, epistaxis and sub-conjunctival hemorrhage were the most common other less common manifestations included gingival bleeding, melena, hematemesis and menorrhagia. The impact of dengue fever on liver function was studied by biochemical tests on 125 males and 145 female patients diagnosed during an outbreak in Taiwan that extended from November 1987 to December 1988.Abnormal levels of AST and ALT were observed in 93% of the cases [15]. Our study at Ganga Ram Hospital extended from 2007 to 2009 showed 60% patients have raised level of AST and ALT. In majority of patients, elevated liver enzymes were found. It is concluded that dengue fever may cause hepatic injury similar to other conventional viral hepatitis[3]. Three patients expired, one patient having complicated diabetes and ischaemic heart disease, second was 70 years old male with no sign of bleed but raised aminotransferases. Third patient were 54 years old female having sever thrombocytopenia, raise aminotransferases and signs of bleed. So over all mortality is less than 1%.

CONCLUSION

Our study at Sir Ganga Ram Hospital Lahore showed that There are definite trends of symptoms in relation to defeverscence of fever. Headache occurs early and bleeding symptoms occur much later. Thrombocytopenia less than 50,000/cmm, leukopenia, elevated liver enzymes, bleeding manifestations and presence of shock indicate severe disease. Platelet count above 50,000/cmm, absence of bleeding manifestations, absence of shock, normal liver enzymes and normal white cell count indicate mild disease.

REFERENCES

1. Guzman MG, Kouri G. Dengue: an update.Lancet infec dis. 2002;2 33-34.
2. Luiz Jose de Souza , Jose Galvao Alves, Rita Maria Ribeiro Nogueiro et al. Aminotransferase changes and acute hepatitis in patients with dengue fever: analysis of 1,585 cases. Brazilian Journal of Infectious Disease vol. 8 no. 2 Salvador Apr.2004.
3. Suzanne Moore Shephered, Patrick B Hinfey, William H Shoff. Dengue Fever. e Medicine Nov 2007. Page 1-19.
4. Luiz Jose de Souza , Helder Goncalves carneiro, et al. hepatitis in dengue shock syndrome. Brazilian Journal of Infectious Disease 2002;6 (6):322-327.
5. Guzman MG, Kouri G. Dengue and Dengue Haemmhoragic fever in the Americas: lessons and challenges. J ClinVirol 2003; 27(1): 1-13.
6. Annelies Wilder Smith and Paul AnanthTambyah. Severe Dengue Virus in Travelers. Journal of Infectious Diseases.2007; 195:8, 1081-1083.
7. James A .Potts, Alan L.Rothmann. Clinical and Laboratory features that distinguish Dengue from Other Febrile Illnesses in Endemic Populations. Tropical Medicine and International Health 2008: 13:11, 1328-1340.
8. Ratageri VH ,Sherpur TA, Wari PK et al. Clinical Profile And Outcome Of Dengue Fever Cases. Indian Journal of Paediatrics.2005; 72[8]; 705-7.
9. Kamath S. Clinical features and Complications and Atypical Manifestations of Children with Severe forms of Dengue Haemmhoragic Fever in South India. Indian journal of Paedriatics.2006; 73(10): 889-895
10. Innis BL, Nisalak A, Nimmannitya, et al. an enzyme linked immunosorbant assay to characterize dengue infections where dengue and japanese encphlitis co-circulate. Am j Trop med Hyg 1989;40:418-27.
11. Angel Balmaseda, Samantha N H, Maria AP, Ram et al. Assement of the WORLD HEALTH ORGANIZATION Scheme for classificationof dengue severity in Nicaragua. J. Trop. Med. Hyg., 73(6), 2005, pp. 1059-1062.
12. Ahmed S, Arif F, Yahiya, et al. Dengue Fever Outbreak in Karachi 2006. A Study of Profile and Outcome OF Children Under 15 Years OF Age.Pak Med Assoc.208; 58[1]; 4-8.
13. Centers for disease control and prevention. Travel-associated dengue infections – united states, 2001-2004. MMWR MorbMortalWklyRep2005;54:556-8.
14. TransomsriSrichaikul, and SuchitraNimmanityo . Haematology in Dengue and Dengue Haemmhoragic Fever , Baillierie's Clinical Haematology ,Vol 13 ,no 2, pp261-267.
15. Communicable disease surveillance and response Clinical Diagnosis, treatment, prevention and control 2nd edition GENEVA WHO c2004 cited 2005 March 24.