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DENGUE FEVER;

THE CLINICAL PATTERN AND MORTALITY IN EPIDEMIC AND POST EPIDEMIC YEARS IN SWAT

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ABSTRACT… Introduction: Dengue fever is arboviral infection transmitted from infected person to non-infected one by mosquitoes Aedes Aegypti or Aedes albopectis. All four serotypes (DEN-1, DEN-2, DEN-3 & DEN-4) can cause the clinical manifestations of disease. Dengue infection can cause acute febrile illness, dengue hemorrhagic fever (DHF) and dengue shock syndrome (DSS). About 50-100 million cases of dengue fever reported annually worldwide in which 0.5 million may need admission. Overall mortality of dengue fever is 3%. The diagnosis of dengue is established by classical clinical features along with specific investigations like PCR, detection of dengue NS1 antigen or IgM or IgG antibodies in the blood of infected person. Dengue is endemic in most part of our country and can become epidemics on and off. **Objectives:** To study the pattern and mortality of Dengue fever during epidemic and post epidemic years in Swat. **Setting:** This study was conducted in Medical Department of Saidu Group of Teaching Hospital, Swat. **Period:** Aug 2013 to November, 2016. **Patients and method:** Patients suffering from acute febrile illness with features suggestive of Dengue fever were included in the study. Clinical criteria for initial diagnosis directed the subsequent diagnostic work up. Dengue was confirmed in these patients by either Dengue NS1 or Ig M antibodies in their blood. Written consent for participation in study was taken from all the included patients. Formal permission was taken from Institutional Review Board of the institution to perform this study. The clinical and laboratory data were recorded on a proforma and analyzed using SPSS 20. **Results:** Among 5569 patients, 3834 (68.85 %) were male and 1735 (31.15%) were female. The mean age of the patients was 30 years SD 15.20. The most common age group that suffered with Dengue fever was the adult age group (13-30 years). Dengue Hemorrhegic Fever was diagnosed in 2543 (45.6%) patients and 50 (0.89 %) had features of DSS. A total 5018 (90.1 %) patients were completely cured while 37 (0.66 %) patients died. The overall mortality was 0.66%. Patients with Dengue fever presented to the hospital though out the year but more than 50% of cases were reported in the month of September. **Conclusion:** Adult age group and male gender is most commonly affected by Dengue fever. Dengue fever was endemic in Swat valley and it can become cyclic epidemic in post epidemic years. Dengue fever can claim so many precious lives if proper preventive measures were not taken in future.

Key words: Dengue Fever, Dengue Hemorrhagic Fever, Dengue Shocks Syndrome.

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INTRODUCTION

Dengue is recognized as one of the increasingly emerging infection of world. Almost 50-100 million cases of dengue fever are reported annually word wide.[1] In Pakistan first epidemic dengue fever was reported in 1994 at Karachi.[2] Dengue virus is now endemic in Pakistan, circulating throughout the years with a peak incidence in the post moon soon period.[3] Ades Egypti or Ades Albopectus, is the mosquitoes responsible for the transmission of dengue fever from an infected person to a healthy one. It is primarily a daytime feeder which lives around human habitat. The favorite breeding places of the mosquitoes are barrels, drum, canes, pots, buckets, flower races, plant sources, tanks, discarded bottles/canes, tiles, water coolers and places where rain water collects.[4] The causative virus is one of the four different serotypes (DEN-1, DEN-2, DEN-3 & DEN-4). The incubation period of gangue fever is 2-8 days.[5]

The clinical features of dengue infection vary

according to the age of patients. The infant and young children can have only non-specific acute febrile illness with or without rash. The older children and adult one can have a mild classical illness of dengue fever with abrupt onset of high grade fever, severe headache (ret orbital headache) muscle & joint pain and rash.[3] Some of the patients with dengue infection can have dengue hemorrhagic fever (DHF) or even dengue shock syndrome (DSS). The risk of sever disease like DHF and DSS is higher in sequential rather than primary infection.[6]

Epidemic potential of dengue fever depends on viremia level, infectivity and serotype of the virus. DHF risk is greater for DEN-2 followed by DEN-3.[7] According to a study by NIH ISLAMABAD, all four serotypes of dengue virus are circulating in Khyber Pakhtunkhwa but the most common serotypes were DEN- 2 & DEN-3.[8]

Diagnosis of dengue fever or its complication needs culture of virus, detection of viral DNA with PCR or by serology. Low white blood cell count, low platelets count, deranged liver function test (LFT), IgM and IgG antibodies level for the detection of disease are other important tests.[9] Primary dengue fever needs only supportive treatment but dengue with complications like DHF and DSS needs intensive cares.[10]

In previous 2-3 years, dengue was endemic in lush valley of Swat, but from 2013 it appeared in epidemic form.[11]

The aim of this study is to know the pattern and mortality of dengue fever in Swat valley and adjacent areas.

PATIENTS AND METHODS

This descriptive case series was conducted in Department of Medicine, Saidu Group of Teaching Hospital Swat from Aug 2013 to November 2016.

All patients of acute febrile illness with classical features of dengue were included in the study. Dengue fever (DF) was defined as fever with or without rash, rets orbital headache, conjunctival congestion and myalgia. Dengue hemorrhagic fever (DHF) was characterized by a triade of hemorrhagic manifestations; platelets count less than 100,000 and clinical signs of plasma leakage in the form of plural effusion, ascites or raised hematocrit. Dengue shock syndrome (DSS) was defined with features of shock in the form of rapid weak pulse and hypotension with systolic blood pressure less than 90 mmHg. Platelets count was done by SymexKX-21 and thrombocytopenia was also confirmed by peripheral blood smear.

Baseline investigations of all patients were sent to the hospital main laboratory. The diagnosis of dengue was confirmed by either detection of dengue NS1 antigen or IgM antibodies in the blood of patients depending on the duration of illness.

In some cases, where other complication were suspected, abdominal ultrasound, LFTs, ECG, echo renal function were also advised. Those patients who need intensive care were shifted to HDU/ICU. Ten samples of blood were taken and sent to NIH, Islamabad for PCR detection.

Patients who presented with acute febrile illness and evidence of Dengue fever were included in the study. Patients, who presented with acute febrile illness but were having evidence of other diseases like malaria, typhoid, urinary tract infection, respiratory tract infection and meningitis were excluded from the study.

Informed consent was taken from patients and Institution Review Board to conduct this study. All information, clinical findings and investigations of patients were recorded on a structured proforma and were analyzed using SPSS 20.

RESULTS

A total 5569 patients were included. Dengue fever was confirmed in 4177 (75 %) by dengue NS1 and 1392 (25 %) by Ig M. Out of 5569 patients, 3834 (68.85 %) were male and 1735 (31.15 %) were female. The mean age of the patients was 30 years with SD 15.20 with standard error of 0.20. Age distribution of patients is shown in Table-I. Maximum number of patients (54.48%)

presented in month of September as shown in Figure-1. Most of the patients (93.4%) presented to the hospital during 2013 as depicted in Table-II. Three hundred and fifty one (6.3%) patients needed intensive care and were shifted to intensive care unit. Dengue hemorrhagic fever was diagnosed in 2543 (45.6%) patients and 50 (0.89 %) had features of DSS. Among 5569 patients, 5018 (90.1 %) patients were completely cured and 37 (0.66 %) patients died in which 35 (94.59 %) had other serious comorbidities like uncontrolled diabetes mellitus, chronic kidney disease, congestive cardiac failure, stage four malignancies, acute severe asthma. The platelets counts of only 3021(54.25%) patients were more than 100000/cm as shown in Table-III. All these patients with thrombocytopenia did not develop bleeding and were managed with normal saline or dextran 40. Only two of them needed platelet transfusion.

Sr. No.	Age in years	No of patients (%).
1	1-13	500 (8.97)
2	14-30	2935(52.71)
3	31-60	1927(34.61)
4	>61	207(3.71)
Total		5569(100)

Table-I. Age distribution (n=5569)

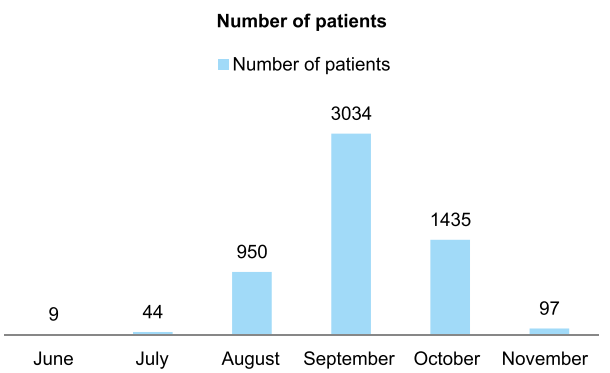

Figure-1. Frequency of presentation of patients during different months

Sr. No.	Year	Number of patients (%)
1	2013	5201(93.4)
2	2014	290(5.2)
3	2015	33(0.6)
4	2016	45(0.8)
Total		5569 (100)

Table-II. Yearly distribution of patients' presentation

Sr. No.	Range of platelet count	Number of patients (%)
1	>100000/C mm	3021 (54.25)
2	99999 to 50000/C mm	1708 (30.67)
3	<50000 to 200000/ c mm	681 (12.23)
4	<20000	159 (2.85)
Total		5569(100)

Table-III. Platelet count of patients with dengue fever

DISCUSSION

The endemic of dengue fever is spreading with rapid expansion of population to new area like from urban to rural one. A severe dengue outbreak appeared in the province of Punjab which badly hit Lahore in 2011 and claimed 290 deaths.[12] Swat, a lush green valley of 1.3 million population remained under militant insurgency from 2007 to 2009. Before 2010, dengue infection was a rare phenomenon observed in the valley. An outbreak of dengue fever was experienced in the month of August in 2013 and extended to November 2013. More than 16000 suspected patients who were having acute febrile illness screened for dengue fever. Among them, 5569 were confirmed as dengue fever. Dengue NS1 was found in 4177 (75%) and 1392 (25%) were detected by dengue IgM anti-bodies. NS1 antigen is abundant in the serum of inpatient during early stages of disease (0-9 days). It is directly correlated with viremia and is an easy, fast and feasible alternative to PCR in developing countries with simple laboratory set up.[13] Dengue IgM anti-bodies start appearing in the blood by 4 to 5 days and peak at two week time. It shows cross reactivity with other flavi virus infection and can give false positive results.[14] False negative IgM reaction can be observed during secondary infection.[15] Despite of this, IgM has high specificity and sensitivity and remains stable at tropical room temperature.[16] In endemic areas like Swat, it is the IgM anti-body detection rather NS1 Ag which has clinched the diagnosis of dengue fever.[17] Therefore we used both NS1 Ag and IgM anti-bodies for the confirmation of dengue. For more accuracy we recorded the day of onset of fever for every patient in our study so we can decide for NS1 Ag or IgM antibodies to be ordered. We have found that dengue was more prevalent in males; the ratio male to female

was (2.2:1). This pattern has been also observed by Garg et al and other workers.[15,18] This male predominance is due to the more chances of exposure of male patient to vector in the form of outdoor activities. Though Dengue fever was found in all age groups but the 13 to 30 years old age was more affected than the others. Similar age pattern was reported from India, Myanmar, Karachi and Lahore.[19,20,21,22,23] Unlike the observation of Garg et al., the least number of children were affected by Dengue fever in our study (1%).[18] For seasonal variation, month wise data was analyzed and it was observed that majority of cases were reported during month of September, which is a post monsoon period in the valley. Such pattern of seasonal variation of the disease was reported by other observers as well. This is due to the favorable temperature and humidity condition in which the vector (mosquito) breeds well.[18,23,19,21,25] The overall mortality in our patients was 0.66 percent and it is a bit higher than the mortality of 0.4 percent as reported by Choudhry M, et al in their study.[11] But our mortality (0.66%) is very low than the mortality of Lahore epidemic (3%) that occurred in of 2011.[26] We have also observed that frequency of DHF patients has increased from 45.6% during epidemics of 2013 and post-epidemic years 2014-15 to 70% in 2016. Though the patients were having DHF in 2016 were not aware of illness in previous years but they can have asymptomatic illness and now it has been presumed that they were having secondary rather than primary dengue infection. This confirmed the view that risk of severe disease is much higher in sequential rather primary dengue infection.[6]

Limitations of the study

This study included only those patients who were either referred to Saidu Group of Teaching Hospital, Swat or they visited on their own to outpatient department. It does not include those patients of swat valley who were treated outside or referred to other hospital of the province or country.

CONCLUSION

The dengue fever, which was endemic in swat valley, can become cyclic epidemic in post epidemic years, if proper preventive measures were not taken in future, the sequential infection again can claim so many lives.

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AUTHORSHIP AND CONTRIBUTION DECLARATION

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2	Bacha Amin Khan	Designed methodology, Acquisition of data, Drafting, Final approval.	
3	Zar Khan	Conceive idea, Drafting, Final approval.	
4	Abid ur Rehman	Analysis of data, Drafting the manuscript, Final approval.	
5	Mohammad Akbar	Interpretation of data, Critical revision, Final approval.	
6	Ishtiaq Ali Khan	Conceive idea, Critical revision, Final approval.	