

Research

Dengue outbreak 2013: Clinical profile of patients presenting at DHQ Burner and THQ Shangla, Khyber Pakhtunkhwa, Pakistan

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Abstract

We evaluated the clinical features, disease severity, laboratory findings and outcome of serologically confirmed cases of Dengue fever in Patients during the recent outbreak in two districts (Buner & Shangla) in 2013, Khyber Pkhtunkhwa, Pakistan. We encountered 320 cases of Dengue fever during 5 months period (July to November, 2013). The dengue infection rate in females (180: 56%.2) was higher as compared to males (140: 43.8%). The dengue infections were more frequently seen in the post-monsoon season than in the monsoon period. The death ratio in the overall weighted prevalence was 0%. All the patients suffered from fever but no specific pattern could be identified, degree was variable ranging from low to high grade. Abdominal pain was the next most common symptom followed by vomiting and diarrhea. Only (45%) patients complained of body aches and pains, (30%) patients had hemorrhagic manifestations in the form of gum bleed, and (05%) patients had melena while (15%) patient's complained of skin rashes. The most common clinical sign was the Enlarged liver that was present in (75%) patients. There is critical need for molecular and entomological surveillance of dengue among the dengue epidemics-prone areas to eliminate the disease.

Keywords

Dengue fever, Splenomegaly (Enlarged liver), Dengue fever, Symptoms

Introduction

An estimated 2.5 billion people living in tropical and subtropical areas, distributed within 100 countries are at risk of epidemic of dengue virus transmission. Annually, more than 100 million cases of classic dengue fever and around 450,000 cases of dengue hemorrhagic fever is notified [1].

The dengue virus (DENV) belongs to flaviviruses having four distinct serotypes (DENV-1, DENV-2, DENV-3 & DENV-4) transmitted by *Aedes aegypti* (primary vector) and *Aedes albopictus* (secondary vector), *Aedes aegypti* a domestic mosquito that prefers to feed on humans. This is a highly urbanized mosquito; breeding in water stored for domestic use or collected rainwater [2].

The first outbreak of Dengue fever in Pakistan was documented in 1994-95 in Karachi. After that multiple outbreaks have been documented from different parts of the country especially Karachi and Lahore [3]. Later, a huge dengue outbreak occurred in Pakistan in 2006 which was due to the co-circulation of DENV-2 and DENV-3 serotypes respectively. Recently, a change in the pattern, clinical spectrum, and outcome of this disease has been reported, with an increased incidence of DHF in clinical practice [4]. Two devastating dengue outbreaks occurred in the country one in Lahore (2011), Punjab Province while the second largest in Swat, KPK Province in 2013 affecting more than

20000 thousands humans with approximately 4000 deaths [2,5,6]. In the current study we focused the two districts (Shangla and Buner, KPK) to whom less attention has been given during the epidemics, to evaluate the clinical features, disease severity, laboratory findings and outcome of serologically confirmed cases of Dengue fever in patients during the recent dengue epidemics in the two districts of KPK.

Materials and Methods

This study was conducted in 5 months period (July to November) of 2013, and the three largest hospitals of district Shangla and Buner were considered for the surveillance of dengue patients. The data/record of dengue patients was obtained from THQ Besham and DHQ Alpori in district Shangla, and DHQ Daggar in district Buner, KPK. The study and associated protocols were designed based on national ethical legislative rules and approved by Local Ethic Committees of AWKUM, Buner Campus. With prior permission from the Medical Superintendents (MSs) of the hospitals, direct interviews and observations were also considered from the admitted patients who presented dengue infection symptoms and fulfilling the diagnostic criteria of dengue fever and dengue hemorrhagic having positive IgG, IgM and NS1 anti-dengue antibodies. All the infected patients were examined thoroughly for Petechiae, Headache, Abdominal

pain, Enlarged liver (splenomegaly), Epistaxis, Gum bleeding, Haematemesis, Loose motion, vomiting. The analysis performed were platelets count, liver function, and anti-dengue antibodies NS1, IgM, IgG with the help of different diagnostic tools.

Results

We came across 320 cases of dengue fever during 5 months period. Out of these, 140 patients were male and 180 were females. Most of the patients belonged to urban areas in Shangla and Buner, KPK. The clinical features have been summarized in (Table 1). All the patients suffered from fever but no specific pattern could be identified, degree was variable ranging from low to high grade. Abdominal pain was the next most common symptom followed by vomiting and diarrhea, only (45%) patients complained of body aches and pain, (30%) patients had hemorrhagic manifestations in the form of gum bleeding and (05%) patients had melena while (15%) of the patients suffered skin rashes (Petechiae). The most common clinical sign was the Enlarged liver that was present in (75%) patients (Table 1).

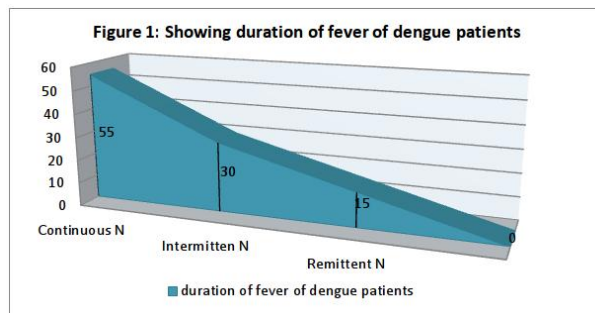
Clinical feature	Percentage
Fever	100%
Abdominal pain	45%
Vomiting	50%
Enlarged liver	75%
Epistaxis	50%
Gum bleeding	30%
Skin rashes	15%
Haematemesis	35%
Melena	05%

Table 1 Clinical features of patients with dengue fever (n=320)

The patients were also observed for dengue fever and DHF, the condition of fever in (55%) patients was continuous up to many days, (30%) patients were presenting the intermittent while (15%) patients presented remittent fever (Table 2 & Fig 1).

Continuous N	Intermittent N	Remittent N
(55%)	(30%)	(15%)

Table 2 Duration of dengue fever in patients (n=320)



The anti dengue antibodies among all the patients (n=320) were showing NS1, IgG and IgM as shown in (Table 3).

Anti-dengue Antibodies	Male	Female	Total
NS1	113	111	224
IgG , IgM	64	32	96

Table 3 Showing anti dengue antibodies in patients (n=320)

The platelets count in 10% patients was less than 50,000/cmm, in (35%) patients it ranged from 50,000-100,000/cmm ,while in (55%) patients the platelets count was from 100,000 to 150,000/cmm (Table 4).

Platelets count / cmm	Frequency	Percentage %
>50,000	32	10%
50,000-100,000	112	35%
100,000-150,000	176	55%

Table 4 Showing platelets count/cmm among dengue patients (n=320)

Additionally, the month wise dengue incidences were also determined by analyzing the data obtained from hospitals. The rate of dengue infection was lowest in July (05%) followed by November (10%) and highest in the month of September (45%) followed by August (23%) and October (17%) (Fig 2). This might be explained because of the heavy rain fall during late summers (August-November), which has favored the increase in dengue mosquito density and subsequently became the cause of frequent human-mosquito contacts. This frequent contact between humans and vector mosquito led to more transmission of dengue virus and as a result a rising trend of dengue incidences was observed during these months (Fig 2).

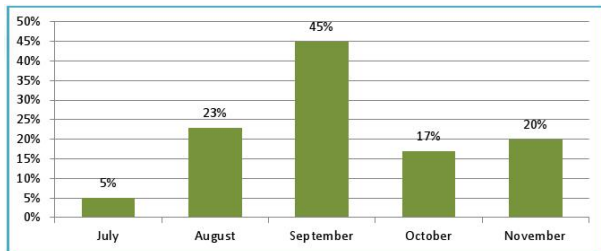


Figure 2 Month wise dengue infections (July-November)

Discussion

Dengue virus is believed to come in Pakistan with tyres at Karachi sea port carrying eggs of infected mosquitoes. To date, dengue virus infection has caused several outbreaks in Pakistan [7]. Until 1994, there was no valid data available about dengue infection cases in Pakistan. In 1982, Dengue was identified in Pakistan, Punjab. Out of 174 patients, 12 were dengue virus positive [8].

Sajid et al [9] reported about the 2011 dengue outbreak in Faisalabad, they encountered 35 cases of dengue, 20 patients were male and 15 were females. No specific pattern of fever was identified by them. Abdominal pain was the most common symptom (51%). Splenomegaly was present in 94% of cases. Majority of the patients were anemic with Hb<10g% and platelet count ranged between 50,000-100,000 cmm. The similar results have been found in the present research work, we observed 320 cases of dengue, 20 patients from Buner while 300 from district Shangla. We too observed the pain as the most common symptom in all the patients followed by the enlarged liver (Table 1). A molecular study [6] of this outbreak has already been explained by the circulation of two dengue serotypes (DENV-2 and DENV-3).

Here in our study we observed that most of the people were suffering from bleeding from different body parts like nose, gum etc, their biochemical data in hospitals showed that they were the patients of thrombocytopenia and leucopenia. Our study suggests that to avoid this effect (low blood level) the patients must take fluids like juice and those medicines which reduce the risk of thrombocytopenia and leucopenia. Ali et al [5] conducted a detailed study for the first time in Khyber Pakhtunkhwa, a total 612 dengue suspected cases were enrolled in their study. The overall weighted prevalence of dengue-specific antibodies (IgM and/or IgG) was 52.12% and only 23 (3.75%) samples showed both IgG and IgM antibodies. The positivity was higher in patients who had a history of travel to a dengue endemic area as compared to those who did not. A higher incidence of IgM and IgG was observed in urban areas than in rural areas. Symptoms including fever, headache, Skin rash, joint pain and Fatigue were significantly linked to dengue fever. IgM and IgG antibodies were more frequently seen in the post-monsoon season (68.33%) than in the monsoon period (31.68%). Similarly in our study all the patients were belonging to urban areas as compared to rural areas, the male were more

positive as compared to female (Table 3), during an interview from one of the patient, it became quite clear that history of travel plays an important role in the geographic expansion of dengue in a region. This study suggests that during dengue epidemics, the preventive measures should be strictly followed for national and international travels so that the disease may not spread from dengue endemic part to non endemic part of a region.

In the current study, the dengue infection rate was much high in male population as compared to females (Table 3), the duration of fever was observed between 4-7 days, most of the patients presented the remittent duration of fever (Table 2; Fig 1). Low platelets count was also taken into account during this study. This study has confirmed that during DF & DHF the platelets count gradually decreases and patients with low platelets count are in more severe conditions (Table 4).

Dengue is noticed as an urban disease and the deadly disease partially attributed to gradually more populated towns in rural areas as well [5]. We identified dengue cases during the period of August–October in 2013 (Fig 2). The data from hospital showed that most of the patients were belonging to urban areas as compared to rural areas, which is in agreement with the results of Khan et al [2]. The present study observed that the post-monsoon season (August-September) (Fig 2) is a peak period for dengue infection which might be due to high humidity after heavy rain fall, which favors the breeding of mosquitoes, our result is congruent with a national report [10], and an international report [11]. In a study from Singapore, Low et al. reported that fever, headache, joint pain, fatigue, and skin rashes are statistically associated with dengue [12]. Similarly, we observed the symptoms of dengue patients like fever, headache, joint pain, and fatigue (Table 1). From the current as well as previous studies, it is clear that dengue cases show cyclical variation with high epidemic and non-epidemic years. Dengue often presents in the form of huge outbreaks. There is, also a seasonality of dengue, with outbreaks occurring in different periods of the year. This seasonality is determined by high transmission of this disease, which is influenced by characteristics of the host, the vector and also the agent.

Conclusion

The policy makers and the government of Khyber Pakhtunkhwa urgently need to make efforts to prevent disease and to implement the vector control strategies by biological and/or environmental measures, chemical measures, and education in the area. Moreover a strong campaign if initiated would create awareness among the populations of these areas. Finally there is need to carry out further research studies on seroprevalence on a large scale to determine the real magnitude of the problem.

Additionally, these results indicate a large earlier exposure of the people of Shangla and Buner to dengue infection which further necessitates the

critical analysis to characterize the current dengue virus circulation patterns and to identify the linked serotypes and genotypes.

Competing Interests

The authors have declared no competing interests.

Authors Contribution

Conceived and designed the research: JK. Performed the experiments: AK WM. Analyzed the data: JK AK. Contributed reagents/materials/analysis tools: JK. Wrote the paper: AK. Provided suggestions and comments on the manuscript: JK.

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