Original Article

DENGUE FEVER OUTBREAK 2011: CLINICAL PROFILE OF CHILDREN PRESENTING AT MADINA TEACHING HOSPITAL FAISALABAD

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ABSTRACT

Objectives:

To evaluate the clinical features, disease severity, laboratory findings and outcome of serologically confirmed cases of Dengue fever in children during the recent outbreak in 2011.

Methods:

This case series was conducted at the department of Pediatrics in collaboration with the Pathology Department of Madina Teaching Hospital/University Medical College, Faisalabad, during the recent epidemic of Dengue fever in Pakistan i.e., August–October 2011. Clinically and serologically confirmed cases of Dengue fever were included in the study. Data was analyzed by SPSS version 19.

Results:

We encountered 35 cases of Dengue fever, 20 patients were male and 15 were females. Twenty nine patients belonged to rural area and 6 came from urban society. Mean age of the patients was 7 years±3.21SD. No specific pattern of fever could be identified. Abdominal pain was the most common symptom (51%). Only 2 patients complained of body aches and pains. Splenomegaly was present in 94% of cases.

Majority of the patients were anemic with Hb <10g%.(p value=0.002) and platelet count ranged between 50, 000-100,000 cmm. Fifteen children had mild elevation of SGPT. Malarial parasite was found in 66% of cases (p value=0.063). All the patients improved over a period of 5-15 days.

Conclusion:

As there is variation in the clinical presentation of Dengue fever in children, continuous surveillance and further studies are required to identify the clinical features of Dengue fever in children of Pakistan. During Dengue fever outbreaks, the disease must also be suspected in patients having malaria.

Keywords: Dengue fever, malaria, splenomegaly

INTRODUCTION

Dengue virus has become a major concern regarding public health in tropical and subtropical countries. Dengue virus has 4 serotypes and transmitted by the day time biting mosquito *Aedes aegypti*, that has been

Corresponding Author: Dr. Aisha Sajid, Assistant Professor, University Medical & Dental College, Faisalabad. Email: draisha_tanvir@hotmail.com highly urbanized.¹ The four closely related, but antigenically distinct, serotypes of DENs (DEN-1, DEN-2, DEN-3 and DEN-4) do not cross-protect rather they can cross react. Infection with one of these serotypes provides lifelong immunity (Ig G) to that particular serotype only. Therefore, persons can acquire a second dengue infection from a different serotype which can lead to more severe form of the disease i.e., dengue hemorrhagic fever.²

Clinical manifestations of Dengue fever include headache, fever, myalgia, arthralgia, leucopenia and thrombocytopenia.³ Dengue

hemorrhagic fever is characterized by appearance of hemorrhagic manifestations in addition to above while Dengue shock syndrome is characterized by shock, capillary leakage and altered mental status.⁴

Early in the 20th century, the epidemics of Dengue fever were common in temperate areas of America, Europe, Australia and Asia but now Dengue fever has become endemic in Tropical Asia, South Pacific Islands, Northern Australia, Tropical Africa, Caribbean, Central and South America.¹ According to World Health Organization, Annual occurrence rate of Dengue fever and Dengue hemorrhagic fever all over the world is about 50-100 million and 50,000 cases respectively. An estimated 2000 annual deaths occur out of these reported cases due to its complications.⁵ The first outbreak of Dengue fever in Pakistan was documented in 1994-95 in Karachi.⁶ After outbreaks that different have been documented from different areas of Pakistan especially Karachi and Lahore.7,8,9 Although children constitute the main group that has been affected by the disease but little data published regarding has been Dengue infection in children in South Asia.¹⁰

The present study was conducted to evaluate the clinical features of Dengue fever in children during the recent outbreak in Pakistan.

PATIENTS AND METHODS

This case series was conducted at the department of Pediatrics in collaboration with the Pathology department of Madina Teaching Hospital/University Medical College, Faisalabad, during the peak months of recent epidemic of Dengue fever in Pakistan. Data was collected from the patients admitted with Dengue fever from August-October 2011. The patients who presented with febrile illness, fulfilling the diagnostic criteria of Dengue fever according to World Health Organization and proven serologically positive for IgM, Ig G anti Dengue antibodies (Confirmed by ELIZA) or both were included in the study.² The patients who were suffering from fever and thrombocytopenia due to any chronic illness like aplastic anemia, acute leukemia, hypersplenism and chronic liver disease were excluded from the study.

Clinical data was recorded that included symptoms, signs and laboratory investigations.

The patients were thoroughly examined for vital signs, anthropometry, skin rash, pleural hepatosplenomegaly, ascites and effusion. Investigations performed were blood counts, peripheral film, typhidot test, liver function tests, abdominal ultra-sonography, Chest X ray and Ig M, Ig G Anti Dengue antibodies (by ELIZA method). Patients were treated symptomatically with intravenous antipyretics, antibiotics fluids. and antimalarials where indicated. Patients were followed with repeated leukocyte and platelet counts daily until they were in the normal range. Statistical analysis was done by SPSS version 19 and p value <0.05 was considered significant.

RESULTS

We came across 35 pediatric cases of Dengue fever during 3 months period. Out of these, 20 patients were male and 15 were females. Twenty nine patients belonged to rural area while only 6 came from urban society. Minimum age of the patient was 2 months and maximum age was 13 years with mean age of 7 ± 3.21 SD.

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 2 patients complained of body aches and pains and 2 patients had hemorrhagic manifestations in the form of gum bleed and melena (Table 1). The most common clinical sign that we detected was the splenomegaly that was present in 94% of cases followed bv pallor and then hepatomegaly (Table 1).

 Table 1. Clinical features of patients with Dengue fever (n=35)

Clinical features	Frequency	Percentage
Fever	35	100
Abdominal Pain	18	51
Vomiting	12	34
Loose motions	6	17
Splenomegaly	33	94
Pallor	23	65
Hepatomegaly	19	54
Myalgia	2	5
Hemorrhagic menifestations	2	5
Skin rash	0	0

Majority of patients had hemoglobin less than 10gm%, only 12 patients presented with hemoglobin more than 10gm% (p value=0.002). Most of the patients had platelet count between 50,000-100,000/cmm and 4 patients had counts below 50,000/cmm. Twenty patients had microcytic hypochromic picture and 15 children had mild elevation of SGPT (Table 2). Majority of the patients presented with fever of short duration but 12 patients had prolonged history >15 days (Figure 1). Sixty six percent of our patients with Dengue fever were also positive for malarial parasite (Figure 2) (p value=0.063).

Table 2. Lab investigations of Dengue fever patients

Lab investigations	Frequency	Percentage
Hemoglobin: • >10g% • 7-10g% • <7 g%	12 20 3	34 58 8
TLC Count /cmm: • <4000 • 4000-11000 • >11000	5 29 1	14 82 2
Platelet count/cmm: • <50,000 • 50,000-100,000 • 100,000-150,000	4 24 7	11 68 20
Peripheral film: Microcytic hypochromic Normocytic normochromic	20 15	57 43
SGPT: • <35 • 35-50	20 15	57 43
Anti Dengue antibodies: • Ig M • Ig M + Ig G	35 12	100 34
Malarial parasite positivity	23	66

Follow up platelet counts were performed, 60% of patients had improvements in their counts in 5 days while remaining improved in 6-10 days (Figure 3). Not a single patient required platelet transfusion and no death encountered in this series.

DISCUSSION

The clinical manifestations of Dengue fever are quite variable depending upon the age of the patient and the type of infecting strain of virus.^{11,12} As far as the disease in children is concerned, limited data is available regarding the Dengue infection in pediatric age group in Pakistan.

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Figure 2. Presence of malarial parasite in Dengue fever







Majority of the patients were male in our study that is similar finding in other studies carried in India.^{13,14,15} The finding could be explained by the more exposure of male children due to their involvement in outdoor activities during the day timings. High grade fever was present in all the children followed by abdominal pain (51%) and vomiting (34%). Although the etiology of abdominal pain remains obscure in Dengue fever but it could be due to raised amylase level and enlarged pancreas.¹⁶ These results are comparable to the study carried in Jeddah by Maimoona, where fever, vomiting and abdominal pain more common symptoms, were while headache, retero orbital pain, myalgia and skin rash were very rare.¹⁷ None of our patient presented with skin rash of any type. Abdominal pain was also found in 60% of children with Dengue fever in Bangla Desh in 2009.18

Splenomegaly was the most common clinical sign in our study (94%) whereas the studies carried out in India and Bangla Desh documented, the frequency of splenomegaly in 32.4% and 3% children of Dengue fever.^{15,18} Faridi found all the patients of Dengue fever had hepatomegaly whereas in our study the hepatomegaly was found in only 54% of cases.¹⁵

A study carried in Karachi in 2006 showed hepatomegaly in 37% of cases and splenomegaly in only 2% of children while majority of the patients (57%) were anemic just like our study. Thrombocytopenia was the consistent finding in our patients and most of the patients had counts between 50,000-100,000/cmm. Many studies report that thrombocytopenia is the commonest but not the constant finding in Dengue fever.^{20,21}

The study Karachi showed done in thrombocytopenia in 86% of children and leucopenia in 43% of cases which is in contrast to our study where we documented leucopenia in only 5 patients (14%).¹⁹ In our study SGPT level was also mildly elevated (35-50 IU) in about 43% of cases which is comparable to 40% cases in Jamshoro and 22% of cases in a study done in India.^{21,15} All the patients were Iq M positive but only 34% cases were positive both for Iq M and Iq G. Sixty six percent of our of cases were also positive for malarial parasite in their peripheral film. This mixed infection by malaria and Dengue fever was also documented in Karachi by Amanullah where 23% of adult patients of Dengue fever were co-infected with malarial parasite.²² Another study done in Attock, also showed combined Dengue and malaria in 81.8% of patients.²³ We could not identify any specific or biphasic pattern of fever, 13 patients had fever lasting for 7 days, whereas 12 patients presented with prolonged history of fever lasting for more than 15 days. This finding was different from those observed in Karachi during 2006 where 40% of children had biphasic pattern and average duration of fever was 5 days.¹⁹ Not а single patient presented with hemorrhagic manifestations and required platelet transfusion. Most of the patients (60%) recovered within 5 days and remaining in 6-10 days both clinically as well as in terms of improvement of platelet counts. These results are comparable to a recent study carried in North India where the mean platelet recovery time was 3.6 ± 1.3 days.

CONCLUSION

This study focused the common clinical manifestations of Dengue fever in children. There are certain differences in clinical presentation if compared with adult patients and also among pediatric patients in different parts of the world. Thus it requires continuous

surveillance and further studies in order to identify the clinical features of Dengue fever in children in our region. Furthermore Dengue fever must also be suspected in malarial endemic areas even if the clinical signs and symptoms are explainable by malaria.

REFERENCES

- Hastead SB. Dengue Fever and Dengue Hemorrhagic Fever. In: Kliegman, Behrman Jenson and Stanton. Nelson Textbook of Pediatrics. 18thed. WB Saunders, 2007: 1412-14.
- 2. Morb Morta Wkly Rep. Dengue hemorrhagic fever-US. *Mexico border*. 2007; 56(31): 785-917.
- WHO (1997). Dengue hemorrhagic fever: diagnosis, treatment, prevention and control, 2nd edition. Geneva: World Health Organization.
- Lee MS, Hwang KP, Chen TC, Lu PL and Chen TP. Clinical characteristics of dengue and dengue hemorrhagic fever in a medical centre of southern Taiwan during the 2002 epidemic. J Microbiol Immunol Infect 2006; 39: 121-9.
- 5. World Health Organization. Scientific Working Group on Dengue. *Meeting report,* Geneva, Switzerland, 3-5 April 2000. Geneva: WHO; 2000.
- Chan YC, Salahuddin NI, Khan J, Tan HC, Seah CL, Li J, *et al.* Dengue haemorrhagic fever outbreak in Karachi, Pakistan, 1994. *Trans R Soc Trop Med Hyg 1995;* 89: 619-2.
- Humayoun MA, Waseem T, Jawa AA, Hashmi MS, Akram J. Multiple dengue serotypes and high frequency of dengue hemorrhagic fever at two tertiary care hospitals in Lahore during the 2008 dengue virus outbreak in Punjab, Pakistan. *Int J Infect Dis. 2010;*14S3:e54–e59.
- Khan E, Kisat M, Khan N, Nasir A, Ayub S and Hasan R. Demographic and Clinical Features of Dengue Fever in Pakistan from 2003–2007: A Retrospective Cross-Sectional Study. *PLoS ONE 2010;* 5(9): e12505.
- 9. Hakim ST, Saleem M and Nadeem SG. An Experience with Dengue in Pakistan: An Expanding Problem. *Ibnosina J Med BS* 2011; 3(1): 3-8.

- 10. Alam AS, Saadat S, Swapan Z, Ahmed A, Karim N, Paul HK and Zaman S. Clinical Profile of Dengue fever in Children. Bangladesh J Child Health 2009; 33(2): 55-58.
- 11. Shah I, Deshpande GC and Tardeja PN. Outbreak of Dengue in Mumbai and predictive markers of Dengue shock syndrome. *J Trop Pediatr. 2004;* 50(5): 301.
- 12. Chadwick D, Arch B, Wilder-Smith A and Paton N. Distinguishing Dengue fever from other infections on the basis of simple clinical and laboratory features: application of logistic regression analysis. *J Clin Virol.* 2006; 35(2): 147-53.
- Dhooria GS, Bhat D and Bais HS. Clinical Profile and Outcome in Children of Dengue fever in North India. *Iran J Pediatr. 2008*; 18(03): 222-28.
- 14. Kulkarni MJ, Sarathi V, Bhalla V, Shirpuri D and Acharay U. Clinico-Epidemiological Profile of Children Hospitalized with Dengue. *Indian J Pediatr 2010;* 77: 1103-07.
- 15. Faridi MA, Aggarwal A, Kumar M and Sarafrazul A. Clinical and Biochemical profile of Dengue Hemorrhagic fever in Children in Delhi. *Tropt Doc 2008;* (38): 128-30.
- 16. Setiawan MW, Samsi TK, Wulur H, Sugianto D and Pool TN. 1998. Epigastric pain and sonographic assessment of the pancreas in Dengue hemorrhagic fever. J *Clin Ultrasound 26:* 257–259.
- 17. Ahmed MM. Clinical Profile of Dengue fever patient infection in King Abdul Aziz University Hospital Saudi Arabia. J Infect Dev Ctries 2010; 4(8): 503-10.
- Alam AS, Saadat S, Swapan Z, Ahmed A, Karim N, Paul HK and Zaman S. Clinical Profile of Dengue fever in children Bangladesh. J Child Health 2009; 33(2): 55-58.
- 19. Ahmed S, Arif F, Yahya Y and Akram DS. Dengue fever outbreak in Karachi 2006–A study of profile and outcome of children under 15 years of age. *JPMA. 2008 Jan;* 58(1): 4-8.
- Itoda I, Masuda G, Suganuma A, Imamura A, Aji-sawa A and Yamada K. Clinical features of 62 imported cases of Dengue fever in Japan. *Am J Trop Med Hyg. 2006 Sep;* 75(3): 470-4.

- 21. Khan AH, Hayat AS, Masood N, Solangi NM and Shaikh TZ Frequency and Clinical Presentation of Dengue Fever at Tertiary Care Hospital of Hyderabad/Jamshoro. *JLUMHS 2010;* 09(2): 88-93.
- 22. Abbasi A, Butt N, Sheikh QH, Bhutto AR, Munir SM and Ahmed SM. Clinical features, diagnostic techniques and management of dual Dengue and malaria infection. J Coll Physicians Surg Pak 19(1): 25-9 (2009).
- 23. Ali N, Nadeem A, Anwar M, Tariq WU and Chotani RA. Dengue fever in Malaria

Endemic areas. J Coll Physicians Surg Pak 2006 May; 16(5): 340-2.

24. Mittal H, Faridi MM, Arora SK and Patil R. Clinicohematological Profile and Platelet Trends in Children with Dengue during 2010 Epidemic in North India. *Indian J Pediatr. 2011 Oct 29.* [Epub ahead of print]
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