

ORIGINAL ARTICLE

Dengue Infection in Pediatric Patients Admitted in A Tertiary Care Hospital in RawalpindiNajaf Masood¹, Muddassar Sharif², Juneda Sarfraz³, Khushdil Khan⁴, Muhammad Khalid Masood⁵, Riffat Omer⁶**ABSTRACT**

Objective: To review clinico-pathological data of Dengue infection in paediatric patients admitted during epidemic of 2015.

Study Design: This was a cross-sectional study.

Place and Duration of Study: The study was conducted at Department of Pediatrics during the epidemic from 1st July to 31st December, 2015.

Materials and Methods: Febrile patients, aged 1-12 year of both genders (fulfilling the criteria of dengue infection according to the reporting form designed by Dengue Advisory Expert group for dengue infection) were included. Their clinical features, blood counts and dengue markers were recorded and followed up during hospital stay. Findings were subjected to SPSS 20 for statistical analysis.

Results: A total of 133 febrile patients, half of them were male, were included after confirmation of diagnosis on dengue markers. More than two third 79.7% patients were above five years of age with mean age 8.5±3.2 year and mean duration of fever was 5.88±2.14 days. Headache was the most prominent symptom in 54.9% febrile patients followed by vomiting 52.6%. Hepatomegaly was seen in 36.8% patients. Dengue fever was the most common presentation followed by Dengue Haemorrhagic fever and Dengue Shock Syndrome. Patients with Dengue Haemorrhagic Fever and Dengue Shock Syndrome had restlessness, abdominal pain and cold clammy skin on presentation. Leukopenia was more frequent than thrombocytopenia.

Conclusion: This study depicts that children more than five year of age more commonly suffer from dengue fever with full recovery within 96 hours of admission. As vaccine is not available in Pakistan, these patients need timely diagnosis and critical monitoring during disease course to prevent mortality.

Key Words: *Dengue Fever, Dengue Hemorrhagic Fever, Diagnosis of Dengue.*

Introduction

Dengue fever (DF) is caused by mosquito borne viruses and clinically results in biphasic fever, myalgia, arthralgia, rash, leukopenia, thrombocytopenia and lymphadenopathy, whereas Dengue Hemorrhagic fever (DHF) is severe often fatal febrile disease which results in increased capillary permeability, abnormalities of hemostasis

and in some cases, cause of Dengue Shock Syndrome (DSS) is considered to have immune-pathologic basis.¹

Dengue infects around fifty million people annually around the globe.^{2,3,4} Incidence of dengue fever has increased by thirty folds over the last fifty years and there is an estimation that 390 million people in 128 countries are at risk of this dreadful viral disease.^{5,6} Pakistan had its first outbreak of dengue in 1994 and since then few epidemics were reported till 2011 when a major epidemic of dengue fever occurred in Punjab especially in Lahore and adjoining areas. In this outbreak more than 21580 confirmed cases and 317 deaths were recorded.⁷

Diagnosis of dengue fever is usually based on its clinical presentation, hematological abnormalities and positive viral serology. Clinical manifestations of dengue fever are variable and are influenced by the age of the patient.⁸ It remained throughout the year in this region and different clinical manifestations have been observed during different epidemic

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periods as described in study conducted in north India.⁹ Rawalpindi also experienced high disease burden since 2011, therefore this study was conducted on pediatric patients to review clinico-pathological data of Dengue infection admitted in a tertiary care Hospital in Rawalpindi during the epidemic of 2015.

Materials and Methods

This was cross-sectional study, conducted at Pediatric Department of a Tertiary Care Health facility after approval from research and ethical committee RMC and Allied hospital Rawalpindi.

Febrile patients aged 1-12 year of both gender were included according to the Reporting form designed by Dengue Advisory Expert group.¹⁰

The children suffering from fever 2-9 days with two or more symptoms (headache, myalgia, arthralgia, retro-orbital pain, abdominal pain, rash, bleeding manifestations, irritability and reduced urine output with positive dengue markers were included in the study.

Patients who had previous history of leukopenia, thrombocytopenia or prolonged history of fever and patients with negative dengue markers were excluded.

Patients with fever and two or more symptoms according to reporting form were admitted in pediatric ward. Blood complete picture was sent to the haematology department of hospital. On the basis of leukopenia (Total Leucocyte Count <4000/cmm) or thrombocytopenia (Platelet <100,000/cmm) patients were classified as probable dengue fever. Later on the presence of dengue markers NS1, IgM and IgG positivity for dengue infection was confirmed by enzyme linked immunosorbent assay from hospital laboratory. All patients were admitted in pediatric dengue ward and monitored for vital signs, urine output, and ultrasound chest/abdomen to rule out any evidence of plasma leak. They were followed up till time of discharge for improvement of symptoms and platelet count.

Results

This study included total 133 febrile patients, half of them were male, after confirmation of diagnosis on dengue markers. More than two third 79.7% patients were above five year of age with mean age 8.5 ± 3.2 year. Demographic data of patients according to

disease spectrum is described in table I. Duration of fever was 2-9 days with mean duration 5.88 ± 2.14 days. Headache was the most prominent symptom in 54.9% febrile patients followed by vomiting 52.6%, myalgia 45.1%, abdominal pain 41.4%, retro-orbital pain and sore throat 21.8% each, arthralgia 19.5%, rash 14.3%, cough 13.5% and diarrhoea 10.5%. Majority of the patient 88.7% did not bleed during course of illness. Only 11.3% patients had bleeding in form of epistaxis, hematemesis, malena, hematuria or petechie, hence it was not found statistically significant in our study. Mean pulse rate was 93.4 ± 17.3 beats/min. Most of the patients were maintaining their blood pressure with mean systolic and diastolic pressure of 92.3 ± 14.2 and 58.9 ± 12.7 respectively. Hepatomegaly was seen in 49 patients while splenomegaly was present in 11 patients. Patients with DHF and DSS had restlessness 3.75% and abdominal pain 7.5% while 3.8% patients had cold clammy skin on presentation. Clinical manifestations are described according to disease spectrum in table II. Blood complete picture revealed mean haemoglobin 12.07 ± 1.73 gm %, mean total leukocyte count $4809 \pm 3091/\text{mm}^3$ and platelet count $103936 \pm 65687.97/\text{mm}^3$. Leukopenia (total leukocyte count less than $4000/\text{mm}^3$) was observed in 48.87% patients while thrombocytopenia less than $50,000/\text{mm}^3$ was seen in only 16.54%. Non-structural protein 1 (NS1) was positive in 63.9% and IgM for dengue was detected in 41.27% patients. DF was the most common presentation in 72.2%, DHF was diagnosed in 19.5% while DSS was in 7.5% patients. DSS was observed more frequent in older age group, among ten patients of DSS, 7 were of more than ten year of age. Ultrasound was normal in patients with Dengue fever. Findings of fluid leak were observed in DHF and DSS patients. Among 36 patients 10 (7.5%) developed pleural effusion and gall bladder wall oedema. Pelvic ascites was as frequently observed as abdominal ascites. Laboratory findings are further described in table III. Patients with dengue fever improved with antipyretics and oral fluids. About 30.1% patients received intravenous normal saline and dextran 40 was administered in 4.5% patients. Blood transfusion was done in 8.3% patients. Platelet count improved within 4 days in 88.7% patients. More than two third 85.7% patients discharged from hospital within 96

hours with no mortality observed during epidemic period in the tertiary care hospital of the study. Features of disease regarding management and course of illness, according to severity of illness are further described in table IV.

Table I: Demographic Features of the Sample

Demographic Features	Dengue Fever n	Dengue Hemorrhagic Fever n	Dengue Shock Syndrome n	Total n
Age in years				
0-5 year	20	6	1	27
6-10 year	45	9	2	56
> 10 year	31	11	8	50
Sex				
Male	44	15	7	66
Female	52	11	4	67

Table II: Clinical Manifestations in Dengue Patients

Clinical Features	Dengue Fever n	Dengue Hemorrhagic Fever n	Dengue Shock Syndrome n	Total n
Fever	97	26	10	133
Headache	52	14	7	73
Vomiting	47	18	5	70
Myalgia	40	13	7	60
Abdominal Pain	36	15	4	55
Arthralgia	18	5	3	26
Retro orbital pain	24	2	3	29
Sore throat	22	4	3	29
Rash	16	2	1	19
Cough	13	5	0	18
Diarrhea	9	4	1	14
Epistaxis	7	3	0	10
Petechie	1	0	1	2
Hematemesis	1	0	0	1
Malena	1	0	0	1
Hematuria	1	0	0	1
Abdominal Tenderness	2	6	4	12
Restlessness	7	1	4	12
Cold Clammy Skin	0	2	3	5
Hepatomegaly	26	17	6	49
Splenomegaly	5	6	0	11

Table III: Laboratory Data in Dengue Patients

Laboratory Data	Dengue Fever n	Dengue Hemorrhagic Fever n	Dengue Shock Syndrome n	Total n
Ultrasound Findings				
Normal	96	0	0	96
Pleural effusion	0	5	5	10
Abdominal Ascites	0	5	3	8
Pelvic Ascites	0	8	1	9
Gall bladder wall thickness	0	8	2	10
Hematological Indices				
Hemoglobin in gm%				
10 or less	9	6	0	15
More than 10	87	20	11	108
Total leukocyte count(mm³)				
Less than 4000	54	9	3	65
More than 4000	42	17	8	67
Platelet count (mm³)				
Less than 50000	15	4	3	22
50,000-100,00	45	14	5	64
More than 100,000	41	8	3	52
Dengue Markers				
NS1	84	21	8	113
IgM	50	15	8	73
IgG	31	14	9	54

Table IV: Management Variables in Dengue Patients

Management Variables	Dengue Fever n	Dengue Hemorrhagic Fever n	Dengue Shock Syndrome n	Total n
Fluid Administered				
Normal Saline	3	26	11	40
Dextran 40	0	1	5	6
Blood transfusion	0	5	6	11
Improvement in Platelet				
Within 4 days	90	20	8	118
More than 4 days	6	6	3	15
Hospital Stay				
Within 4 days	90	17	7	114
More than 4 days	6	9	4	19

Discussion

Dengue is an epidemiologically important mosquito borne viral disease. Significant population of various age groups has suffered from the disease in last two decades in Pakistan. In this study 133 patients were included during six months of epidemic in Rawalpindi. We found two thirds of study population between 5-12 years of age. Same age group is found more affected from dengue infection in different studies conducted in Pakistan^{11,12} and India.¹³ We had no gender difference in this study which is contrary to a study conducted at southern India where 77.31% patients are male.¹⁴ Fever was present in 100% patients followed by headache, vomiting, myalgia, abdominal pain, retro-orbital pain, sore throat, arthralgia, rash, cough and diarrhoea. Frequency of symptoms are consistent with other studies.^{11,14} Rash is one of the prominent clinical feature of dengue also noted in 64.5% patients in one study conducted in India¹⁵ but we observed rash only in 4.3% patients. Bleeding in dengue infection is a common event. Its causes are multifactorial. In this study majority of the patient (88.7%) did not bleed during course of illness which is contrary with the study conducted in Indonesia and Philippines.^{16,17} Hepatomegaly was present in 36.8% in our study that is not as frequent as in study done by Joshi R in Mumbai in which hepatomegaly is present in more than half (66%) patients.¹³ Age less than five year, spontaneous bleed, Hepatomegaly, free fluid in serosal cavities, leukopenia less than 4000/mm³ and thrombocytopenia <50,000/mm³ are significant risk factors in pediatric patients suffering from DHF.^{18,19} None of these findings were found significant in this study.

We found two third of patients with dengue fever with mean duration of fever 5.88±2.14 days. Therefore, Non-structural protein 1(NS1) was the most frequent marker of dengue fever as compared to IgM for dengue fever. This observation is on par with finding of different studies.^{14,19} Pleural effusion and gall bladder wall edema were the most frequent ultrasound findings in this study which is consistent with study conducted in India.²⁰ Normal Saline and dextran found useful in dengue haemorrhagic fever and dengue shock syndrome patients.^{21,22} Same was observed in this study. Blood transfusion was done in 8.3% patients in current study which is not

comparable with one of the Indian study in which only 1.8% children receive blood transfusion.²³ Early detection and timely management of the disease can prevent mortality. In our study more than half of patients 85.71% discharged from hospital within 96 hours with no mortality observed during epidemic period. These findings are concordance with another Indian study.²⁴

Conclusion

This study depicts that children more than five year of age more commonly suffer from dengue fever with recovery within 96 hours of admission. As vaccine is not available in Pakistan, these patients need timely diagnosis and critical monitoring during disease course to prevent mortality.

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