DOI: https://doi.org/10.53350/pjmhs2023172766

ORIGINAL ARTICLE

Clinical Presentation of Dengue Fever Cases from Islamabad: A Retrospective Study

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ABSTRACT

Background: Dengue fever is a mosquito-borne viral infection caused by the virus aedesaegypti.InPakistan, a major dengue epidemic appeared in 2011. The objective of the present study is to observe the clinical presentations of dengue fever in a recent outbreak in 2022.

Method: The retrospective study was performed on 174 patients diagnosed with dengue fever aged 13 to 60 years. Data regarding age, gender, and clinical symptoms i.e. fever, myalgia, nausea, vomiting, abdominal pain.

Results: Most of the patients were from the 18-25 years age group. with a greater number of males compared to females. The common presentation of dengue fever was fever and myalgia, observed in 92% and 62% of the patients, respectively. A platelet count of less than 1,00,000 was observed in 85% of patients, whereas decreased total leukocyte count (TLC) and hematocrit were observed in 50% and 46.8% of patients, respectively.

Practical Implication: On the documentation, reporting, and management of these co-morbidities, there were no local regulations accessible. This study determined the frequency of co-morbidities in dengue patients and analyse the early dengue case presentations.

Conclusion: Patients presenting with fever, hemorrhagic symptoms, or signs of plasma leakage should be promptly suspected, timely diagnosed, and managed on the grounds of dengue fever.

Keywords: Dengue fever, Viral Infection, Diagnosis, Morbidity, Mortality Retrospective study

INTRODUCTION

Dengue is a mosquito-borne viral infection that causes mild to severe illness. It is estimated that 50-100 million infections occur in over 100 endemic countries putting almost half of the world's population at risk [[1]]. The disease is transmitted to humans by the bite of female Aedesaegypti[1]. The infection leads to a spectrum of diseases ranging from sub-clinical infection to dengue fever and most severe forms like dengue hemorrhagic fever and dengue shock syndrome [2]. In recent decades, dengue fever has become the second most prevalent mosquito-borne infection after malaria.The disease results in huge morbidity and mortality and causes significant economic burdens in endemic countries [3].

It has overtaken malaria as the second most common infection spread by Aedes aegypti mosquitoes in recent years[3]. Nearly 120 nations have been afflicted by dengue, and many of those have high incidence rates [[4, 5]], placing half of the world's population at risk. The WHO estimates that there are presently 50–100 million dengue cases worldwide [[6]]. From subclinical infection to dengue fever and its most severe manifestations, such as dengue hemorrhagic fever and dengue shock syndrome, the dengue virus can cause a wide range of illnesses [[7]]. Dengue fever is a mosquito-borne viral infection caused by the virus aedesaegypti.In Pakistan, a major dengue epidemic appeared in 2011. The objective of the present study is to observe the clinical presentations of dengue fever in a recent outbreak in 2022.

METHODS

The present observational study was conducted at a tertiary care hospital during the dengue fever season in 2022. All patients presenting to the outpatient department with complaints of fever and clinical features of dengue with a positive test (dengue NS1) were included in this study. The study was conducted by ethical principles following the approval of the Ethical Review Committee of the Pakistan Institute of Medical Sciences (PIMS). The study includes all the patients from the dengue ward of the hospital; male and female patients above 14 years of age with bleeding manifestations and thrombocytopenia with platelet count (less than or equal to 100,000/µL). Patients with other viral or bacterial infections after a routine lab test and those who refused to participate in the survey were excluded from the study.

Data Collection: Information like age, gender, fever duration, myalgia, nausea/vomiting, epistaxis, abdominal pain, diarrhea, Malena, HCT increase, mucosal bleeding, lethargy, hemoglobin level, TLC count, platelet count, urea and creatinine level was taken. Based on the presence of clinical symptoms, patients were classified as having dengue fever without warning signals (DF), dengue fever with warning signs (DFWS), or severe dengue (SD). The data were tabulated and presented as numbers (percentages).

RESULTS

A total of 174 patients were enrolled to conduct this research study. Among the age group, 13-17 (n=26) patients reporteda fever of 23 (88%),myalgia of 12 (46%), nausea/vomiting of 13 (50%),Hb abnormal level of 5 (19%), platelet count of less than 100,000 19 (73%), Non-Structure protein 1 test positive 24 (92%), elevated IgM 24 (92%), elevated IgG 1 (4%), hematocrit (HCT) 8 (31%), TLC count <5000 16 (62%), elevated urea in 5 (19%), elevated ALT level in 19 (73%), Mucosal bleeding 1 (4%), clinical liquid accumulation 4 (15%), Melana 2 (8%), abdominal pain 1 (4%) and epistasis 4(15%). Among the age group 18-25 (n=48), patients reported a fever of 45 (94%), myalgia of 27 (56%), nausea/vomiting of 23 (48%),Hb abnormal level of 5 (10%), platelet count of less than 100,000 41 (85%), Non-Structure protein 1 test positive 44 (92%), elevated IgM 5 (10%), elevated IgG 1 (2%), hematocrit (HCT) 19 (40%), TLC count <5000 23 (48%), elevated urea in 18 (38%), elevated ALT level in 37 (77%), Mucosal bleeding 5 (10%), clinical liquid accumulation 10 (20%), Melana 1 (2%), abdominal pain 9 (18%) and epistasis 16 (33%). Among the age group 26-35, (n=25) patients reported fever 23 (92%), myalgia 15 (60%), nausea/vomiting 11 (44%),Hb abnormal level 1 (4%), platelet count less than 100,000 24 (96%), Non-Structure protein 1 test positive 24 (96%), elevated IgM 2 (8%), elevated IgG 4 (16%), hematocrit (HCT) 8 (32%), TLC count <5000 11 (11%), elevated urea in 8 (32%), elevated ALT level in

23 (92%), Mucosal bleeding 2 (8%), clinical liquid accumulation 5 (10%), Melana 4 (16%), abdominal pain 9 (36%) and epistasis 4 (16%). Among the age group 36-45, (n=23) patients reported a fever of 21 (91%), myalgia of 16 (70%), nausea/vomiting of 12 (52%),Hb abnormal level 1 (4%), platelet count less than 100,000 22 (96%), Non-Structure protein 1 test positive 22 (96%), elevated IgM 2 (9%), elevated IgG 2 (9%), hematocrit (HCT) 7 (30%), TLC count <5000 14 (61%), elevated urea in 10 (43%), elevated ALT level in 22 (96%), Mucosal bleeding 5 (22%), clinical liquid accumulation 6 (26%), Melana 1 (4%), abdominal pain 4 (17%) and epistasis 2 (9%). Among the age group 45-55, (n=23) patients reported fever 22 (95%), myalgia 16 (70%), nausea/vomiting 10 (43%),Hb abnormal level 2 (9%), platelet count less than 100,000 20 (87%), Non-Structure protein 1 test positive 20 (87%), elevated IgM 3 (13%), elevated IgG 3 (13%), hematocrit (HCT) 6 (26%), TLC count <5000 12 (52%), elevated urea in 10 (43%), elevated ALT level in 22 (95%), Mucosal bleeding 2 (9%), clinical liquid accumulation 3 (13%), Melana 0 (0%), abdominal pain 3 (13%) and epistasis 4 (17%).

Among age group 55 and above, (n=22) patients reported a fever of 20 (91%), myalgia of 12 (54%), nausea/vomiting of 14 (64%),Hb abnormal level of 3 (14%), platelet count less than 100,000 20 (91%), Non-Structure protein 1 test positive 22 (100%), elevated IgM 0 (0%), elevated IgG 0 (0%), hematocrit (HCT) 6 (27%), TLC count <5000 11 (50%), elevated urea in 10 (45%), elevated ALT level in 20 (91%), Mucosal bleeding 1 (5%), clinical liquid accumulation 4 (18%), Melana 0 (0%), abdominal pain 3 (14%) and epistasis 7 (31%). The mean standard deviation age was 34.56 ±15.76 years. In all age groups, the p-value was found for fever (0.40), myalgia (0.67), nausea/vomiting (0.77),Hb abnormal level (0.44), platelet counts less than 100,000 (0.26), Non-Structure protein 1 test positive (0.57), elevated IgM (0.70), elevated IgG (0.123%), hematocrit (HCT) (0.63%), TLC count <5000 (0.52), elevated urea (0.420%), elevated ALT level (0.04), Mucosal bleeding (0.37), clinical liquid accumulation (0.88), Melana (0.06), abdominal pain (0.82) and epistasis (0.12) (table 1).

Table 1: Distribution of risk factors among age groups

Age groups													
Characteristics	13-17 (n=26)		18-25 (n=48)		26-35 (n=25)		36-45 (n=23)		45-55 (n=23)		55 above (n=22)		p-value
Mean-SD	34.56 -15.76												
Fever	23	88%	45	94%	23	92%	21	91%	22	95%	20	91%	0.40
Myalgia	12	46%	27	56%	15	60%	16	70%	16	70%	12	54%	0.67
Nausea/vomiting	13	50%	23	48%	11	44%	12	52%	10	43%	14	64%	0.77
Hb	5	19%	5	10%	1	4%	1	4%	2	9%	3	14%	0.44
Platelets>1000,000	19	73%	41	85%	24	96%	21	91%	20	87%	20	91%	0.26
NS1	24	92%	44	92%	24	96%	22	96%	20	87%	22	100%	0.57
IgM	2	8%	5	10%	2	8%	2	9%	3	13%	0	0	0.70
IgG	1	4%	1	2%	4	16%	2	9%	3	13%	0	0	0.123
HCT	8	31%	19	40%	8	32%	7	30%	6	26%	6	27%	0.63
TLC<5000	16	62%	23	48%	11	11%	14	61%	12	52%	11	50%	0.52
Urea	5	19%	18	38%	8	32%	10	43%	10	43%	10	45%	0.420
ALT	19	73%	37	77%	23	92%	22	96%	22	95%	20	91%	0.04
Mucosal bleeding	1	4%	5	10%	2	8%	5	22%	2	9%	1	5%	0.37
Clinical liquid accumulation	4	15%	10	20%	5	20%	6	26%	3	13%	4	18%	0.88
Melana	2	8%	1	2%	4	16%	1	4%	0	0	0	0	0.06
Abdominal pain	1	4%	9	18%	9	36%	4	17%	3	13%	3	14%	0.82
Epistasis	4	15%	16	33%	4	16%	2	9%	4	17%	7	31%	0.12

Out of 130 males and 40 females,126 (94%) males and 36 (90%)females reported fever (p=0.90), 79 (59%) males and 26 (65%) reported myalgia (p=0.29), 71 (55%) males and 16 (40%) females reported Nausea/vomiting (p=0.22),9 (6%) males and 9 (23%) females reported Hb abnormal level (p=0.005), 117 (87%) males and 33 (82%) females reported platelet count less than 100,000 (p=0.19), 126 (94%) males and 37 (93%) females reported platelet count less than 100,000 (p=0.19), 126 (94%) males and 37 (93%) females reported non-Structure protein 1 test positive (p=0.72), 10 (7%) males and 4 (10%) females reported elevatedIgM(p=0.66), 12 (9%) males and 1 (3%) females reported hematocrit (HCT) (p=0.17),67 (50%) males and 22 (55%) females reported TLC count <5000 (p=0.76), 10 (7%) males and 4 (10%) females reported elevated urea (p=0.76), 112 (84%) males and 38 (95%) females reported elevated ALT level (p=0.27), 9 (6%) males and 7 (18%) females reported Mucosal bleeding (p=0.02),26 (19%) males and 6 (15%) females reported clinical liquid accumulation (p=0.69), 4 (4%) males and 4 (10%) females reported Melana (p=0.05), 29 (22%) males and 3 (7%) females reported abdominal pain (p=0.05) and 31 (23%) males and 6 (15%) females reported epistatsis (p=0.32) (table 2).

The association of risk factors among different age factors has been represented in Table 3. Results showed that the highest the risk value higher will the chance of persistence of dengue in the body.

Table 2: Distribution of risk factors among Gender

Gender					
Characteristics	Male (n=134)		Female (n=40)		p-value
Fever	126	94%	36	90%	0.90
Myalgia	79	59%	26	65%	0.29
Nausea/vomiting	71	55%	16	40%	0.22
Hb	9	6%	9	23%	0.005
Platelets	117	87%	33	82%	0.19
NS1	126	94%	37	93%	0.72
IgM	10	7%	4	10%	0.66
IgG	12	9%	1	3%	0.17
HCT	51	38%	7	18%	0.02
TLC	67	50%	22	55%	0.76
Urea	52	39%	11	28%	0.23
ALT	112	84%	38	95%	0.27
Mucosal bleeding	9	6%	7	18%	0.02
Clinical liquid accumulation	26	19%	6	15%	0.69
Melana	4	4%	4	10%	0.05
Abdominal pain	29	22%	3	7%	0.05
Epistaxis	31	23%	6	15%	0.32

Table 3: Association of risk factors among age groups and gender

		Age groups					Gender
	Characteristics	18-25 (n=48) R	26-35 (n=25)	36-45 (n=23)	45-55 (n=23)	55 above (n=22)	M/F=134/40
1	Fever	1.95(0.36-10.46) 0.43	1.5 (0.22-9.83) 0.67	1.36 (0.20-9.01) 0.74	2.86(0.27-29.71) 0.37	1.30(0.19-8.60) 0.78	0.87 (0.09-8.07) 0.90
2	Myalgia	1.30(0.50-3.78) 0.53	1.52 (0.47-4.8)	2.4 (0.70-8.48)	2.09 (0.62-7.0) 0.23	1.10 (0.34-3.55) 0.87	0.65 (0.29-1.4)

			0.47	0.15			0.29
3	Nausea/vomiting	0.80 (0.29-2.2) 0.67	0.65 (0.20-2.0) 0.46	0.92 (0.28-2.9) 0.89	0.59 (0.18-1.8) 0.37	1.34 (0.40-4.45) 0.62	1.57 (0.79-3.29) 0.22
4	Hb	0.46 (0.18-1.79) 0.26	0.16 (0.01-1.54) 0.11	0.19 (0.02-1.7) 0.14	0.38 (0.06-2.19) 0.28	0.63 (0.13-3.01) 0.56	0.25 (0.09-0.68) 0.02
5	Platelets	2.6 (0.61-7. 57) 0.23	7.57 (0.83-68.46) 0.07	6.63 (0.73-60.21) 0.09	2.10 (0.46-9.64) 0.33	3.15 (0.56-17.61) 0.19	1.9 (0.70-5.17) 0.20
6	NS1	1.2 (0.19-7.8) 0.83	2.0 (0.17-23.55) 0.58	1.83 (0.15-21.65) 0.63	0.55 (0.08-3.65) 0.54	4.59(0.20-100.90) 0.33	1.27 (0.32-5.05) 0.72
7	IgM	1.39 (0.25-7.7) 0.70	1.04 (0.13-8.03) 0.96	1.14 (0.14-8.83) 0.89	1.8 (0.27-11.85) 0.54	0.21(0.009-4.78) 0.33	0.76(0.22-2.58) 0.66
8	IgG	0.54 (0.03-9.06) 0.67	4.7 (0.49- 45.9) 0.17	2.3 (0.20-28.13) 0.49	3.7 (0.36-38.8) 0.26	0.37(0.01-9.74) 0.55	3.8 (0.38-30.44) 0.20
9	HCT	1.15 (0.35-3.5) 0.84	0.56 (0.15-2.01) 0.37	0.65 (0.17-2.48) 58	0.48 (0.12-1.85) 0.28	0.61 (0.15-2.43) 0.48	2.79(1.10-7.04) 0.02
10	TLC	0.46 (0.16-1.27) 0.13	0.39 (0.12-1.25) 0.11	0.87 (0.26-2.94) 0.82	0.54 90.16-1.7) 0.31	0.50 (0.15-1.6) 0.25	0.89 (0.44-1.83) 0.76
11	Urea	2.6 (0.79-8.87) 0.11	2.48 (0.61-10.05) 0.20	3.1 (0.79-12.14) 0.10	4.0 (0.98-16.31) 0.05	3.5 (0.88-13.92) 0.07	1.66(0.71-3.87) 0.23
12	ALT	1.23 (0.41-3.7) 0.70	4.23 (0.78-22.84) 0.09	8.10 (0.91-71.94) 0.60	8.10 (0.91-71.94) 0.60	3.68 (0.67-20.01) 0.13	0.53 (0.17-1.65) 0.27
13	Mucosal bleeding	2.42 (0.26-22.51) 0.43	1.45 (0.12-17.46) 0.76	5.71 (0.59-54.96) 0.13	1.77 (0.14-21.50) 0.65	1.00 (0.05-17.41) 1.00	0.29 (0.09-0.85) 0.02
14	Clinical liquid accumulation	1.16 (0.30-4.40) 0.82	0.85 (0.19-3.80) 0.83	1.5 (0.34-6.59) 0.59	0.57 (0.10-3.02) 0.51	1.0 (0.20-4.8) 1.00	1.22 (0.45-3.31) 0.69
15	Melana	0.23 (0.02-2.7) 0.25	2.1 (0.34-12.7) 0.42	0.50 (0.04-5.94) 0.58	0.20(0.009-4.57) 0.31	0.21(0.009-4.78) 0.33	0.26 (0.06-1.10) 0.06
16	Abdominal pain	5.5 (0.65-46.42) 0.11	13.2 (1.51-115.34) 0.02	6.4 (0.69-60.68) 0.10	3.3 (0.31-34.35) 0.31	3.4 (0.33-36.24) 0.29	3.25 (0.93-11.36) 0.06
17	Epistaxis	2.62 (0.75-9.04) 0.12	0.95 (0.20-4.35) 0.94	0.47 (0.07-2.9) 0.42	1.0 (0.21-4.5) 1.0	2.2 (0.54-9.01) 0.26	1.61 (0.61-4.23) 0.32

R(95%Confidence interval (upper ranger) mean S.D; R= Risk value., S.D mean Standard Deviation

DISCUSSION

A viral infection transmitted by mosquitoes called dengue can result in moderate to serious sickness [3]. Almost half of the world's population is in danger because of the estimated 50-100 million infections that take place in more than 100 endemic nations. With the bite of a female Aedesaegypti, the illness is spread to humans. Subclinical infections of dengue fever, including its most severe forms like dengue hemorrhagic fever and dengue shock syndrome, are caused by infections [[4]]. During the dengue fever season in 2022, the current observational study was carried out in a tertiary care facility. In this study, all patients who presented to the outpatient clinic complaining of fever and exhibiting clinical signs of dengue with a positive test result (dengue NS1) were included.The study excluded patients who had additional viral or bacterial illnesses following a regular lab test and anyone who declined to do the survey [[8, 9]].This study was conducted to identify the clinical parameters of dengue fever patients in tertiary care hospitals. The study was conducted on 174 patients.Age, gender, the length of the fever, myalgia, nausea/vomiting, epistaxis, stomach discomfort, diarrhea, malena, a rise in the HCT, mucosal bleeding, lethargy, hemoglobin level, the TLC count, platelet count, the level of urea and the level of creatinine were recorded. Patients were categorized as having dengue fever with or without warning signs (DFWS), or as having severe dengue based on the presence of clinical symptoms (SD). Numbers were tabulated from the data and shown (percentages).

Results demonstrated that fever and NS1 were the factors that were directly associated with the manifestations of dengue in all age groups. Similar to our studies, Lucanaet. Et.al. reported the manifestations of dengue fever [[10]]. However, dengue was more prevalent in the age group of 36-45 years.Resultsalso represented that out of 134 male patients, a higher proportion of males were suffering from fever (n=126, 94%, p=0.90), Myalgia (n=79, 59%,p=0.29), drop in platelets (n=117, 87%, p=0.19). In females out of 40 females, a higher proportion of females (n=36, 90%, p=0.90) suffered from fever, Higher ALT concentration was found in 38 (95%, p=0.27) and myalgia was found in 26 (65%, p=0.29) dengue female patients. The study conducted in Khyber Pakhtunkhwa's Swat and Mansehra and Punjab's Lahore and surrounding areas demonstrated that a higher prevalence of 14.50% (n= 69) positive males was found compared to females who were infected at 5.46% (n= 26) positive [[10]]. Results demonstrated that dengue patients were at higher risk of abdominal pain R=13.2 (95% confidence interval= 1.51-115.34) with mean S.D = 0.02 and the least risk factor is linked with a drop in Hb level R=0.25 (95% confidence interval=0.09-0.68) with S.D=0.02. In contracts to our studies, Shams et. al. confirmed that the highest risk factor associated withdengue was the condition thrombopeniawith platelets count of less than 100000 micro/l instead of abdominal pain [[11]].

CONCLUSION

The findings of this research study outline the demographic patterns of dengue. The dengue virus is currently widespread throughout the nation, spreading year-round with a high frequency in the post-monsoon season. The median age of dengue patients has dropped, and younger individuals may be now more vulnerable. More research is required to determine the value of total and differential leukocyte counts for identifying patients who are at risk of hemorrhaging.

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