ORIGINAL RESEARCH

Assessment of cases with dengue infection

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ABSTRACT
Background: Dengue infection is caused by dengue viruses that belong to family flaviviridae which includes four serotypes. The present study was conducted to assess cases of dengue infection. **Materials & Methods:**All consecutive patients of dengue fever admitted in the dedicated seasonal ward or various   medical wards including medical ICU of the Department of Medicine of S.P. Medical College and Associated Group of P.B.M. Hospitals Bikaner, were taken in the study.Diagnosis of dengue fever was done as per WHO guidelines and laboratory confirmation of dengue fever was done by RDT and ELISA.All patients were evaluated thoroughly by clinical history and physical examination as per performa. All patients were also subjected to various laboratory tests. **Results:** Majority (73.0%) patients represented with dengue fever whereas 25.8% patients were suffering from dengue hemorrhagic fever. Only 1.20% patients presented with dengue shock syndrome.The mean platelet count was 50.67 with range of 6-196. Mean TLC was 4306.45 within a range of 900-13500. The mean hematocrit was 42.50 within a range of 30-58. Mean MPV was 8.19, mean PDW 16.38 and mean PCT 0.0479.
Conclusion: Majority of patients represented with dengue fever followed by dengue hemorrhagic fever.
Key words: Dengue infection, flaviviridae, fever

INTRODUCTION

Dengue infection is caused by dengue viruses that belong to family flaviviridae which includes four serotypes (DEN-1, DEN-2, DEN-3 and DEN-4)[1,2]and is transmitted by mosquitoes (Aedes agypti). Dengue infections result in a disease continuum that includes syndromes varying in severity and prognosis. These includes dengue fever (DF), dengue hemorrhagic fever (DHF) and dengue shock syndrome (DSS), the most severe form of DHF. In the past 15 years, there has been a dramatic increase in global incidence of dengue and DHF/DSS.[3] More than 2.5 billion people are now at risk in more than 100 countries worldwide, and every year approximately 50 million infections occurs, including 500000 cases of DSS4. Nearly 95% cases are among children less than 15 years of age, while ≥ 5% of all DHF/DSS cases occurs in infants.[4]

The main hallmark that differentiates DHF from DF is clinically significant vascular permeability usually between 3rd and 6th day of illness, which result in plasma leakage from the intravascular compartment to extravascular space. In less severe cases (non shock DHF grades I and II), plasma leakage is mild to moderate, and many patients recover spontaneously or shortly after administration of intravenous fluids.[5] In more severe cases (DSS grades III and IV), there are large plasma loses, hypovolemic shock ensues, and it can progress rapidly to profound shock, the patient in shock may die within 12– 24 hours if appropriate treatment is not promptly administered. Volume replacement is mainstay of treatment of DHF/DSS.[6] The most significant factor determining clinical response was the pulse pressure at presentation.Dengue infection is caused by dengue viruses that belong to family flaviviridae which includes four serotypes. The present study was conducted to assess cases of dengue infection.

MATERIALS & METHODS

The present study was conducted in the department of Medicine, S.P. Medical college and PBM and associated group hospitals, Bikaner.
All consecutive patients of dengue fever admitted in the dedicated seasonal ward or various   medical wards including medical ICU of the Department of Medicine of S.P. Medical College and Associated Group of P.B.M. Hospitals Bikaner, were taken in the study.Diagnosis of dengue fever was done as per WHO guidelines and laboratory confirmation of dengue fever was done by RDT and ELISA.All patients were evaluated thoroughly by clinical history and physical examination as per performa. All

patients were also subjected to various laboratory tests. Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

RESULTS

Table I: Distribution of study population according to dengue classification

Clinical diagnosis	No.	%
DF	366	73.00%
DHF	129	25.80%
DSS	6	1.20%
TOTAL	**501**	**100.00%**

Table I shows distribution of cases according to clinical diagnosis. Majority (73.0%) patients represented with dengue fever whereas 25.8% patients were suffering from Dengue Hemorrhagic fever. Only 1.20% patients presented with dengue Shock Syndrome.

Table II: Distribution of dengue fever cases according to age &sex variables

Age groups (Age in Years)	Sex					
	Female		Male		Total	
	No.	%	No.	%	No.	%
16-25	42	51.22%	181	63.38%	223	60.66%
26-40	19	23.17%	69	24.30%	88	24.04%
41-50	17	20.73%	29	10.21%	46	12.57%
51-60	4	4.88%	2	0.70%	6	1.64%
>60	0	0.00%	3	1.06%	3	0.82%
Grand Total	**82**	**100.00%**	**284**	**100.00%**	**366**	**100.00%**

Table II shows distribution of dengue fever cases according to age & sex. c

Table III: Hematological investigations at time of admission

Values	Admission day	
	Mean±SD	Range
PLATELET COUNT	50.67±33.73	6-196
TLC	4306.45±2409.66	900-13500
NEUTROPHIL	58.4±12.1	34-90
LYMPHOCYTES	32.9±10.7	16-63
MONOCYTES	8.65±5.58	1-23
RDW	14.39±1.069	11.8-18.2
HEMATOCRIT	42.5004±5.88	30-58
MPV	8.19±0.92	5.7-10.4
PDW	16.38±0.87	14.1-18.9
PCT	0.0479±0.052	0.012-0.64

Table III showing average laboratory parameters of 501 patients on day of admission. The mean platelet count was 50.67 with range of 6-196. Mean TLC was 4306.45 within a range of 900-13500. The mean hematocrit was 42.50 within a range of 30-58. Mean MPV was 8.19, mean PDW 16.38 and mean PCT 0.0479.

Table IV: CBC parameters variation in Dengue syndrome patients with comorbidities

Comorbidities	Platelet Mean±SD	TLC Mean±SD	HCT Mean±SD	MPV Mean±SD	Hb Mean±SD	RDW Mean±SD	PDW Mean±SD	PCT Mean±SD	N Mean±SD	L Mean±SD	M Mean±SD
No	48.78±32.79	4240.25±2362.04	42.65±5.87	8.18±0.92	11.20±3.34	14.39±1.07	16.61±0.85	0.04±0.03	58.45±12.18	32.87±10.81	8.57±5.62
DM	70.60±33.21	4626.66±2550.76	40.62±5.00	8.42±1.03	12.12±4.45	14.53±1.00	16.26±1.02	0.08±0.05	60.46±8.45	31.40±7.08	8.93±4.84
COPD	88.80±31.60	5040.00±4678.72	43.94±6.13	7.72±0.70	12.45±2.15	14.74±0.78	16.78±1.25	0.07±0.04	55.60±20.54	32.40±11.39	12.00±10.07
HTN	65.54±42.86	5054.54±3132.5	40.52±6.20	8.09±0.79	11.80±2.	14.34±1.02	16.17±1.05	0.07±0.04	57.09±11.62	33.90±10.6	9.18±4.23

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CAD	55.33±28.57	5493.33±2463.54	40.96±2.65	8.83±1.00	12.56±4.12	13.83±1.04	16.20±0.60	0.05±0.01	58.66±10.11	31.00±12.16	10.33±2.08
Pregnancy	50.22±12.54	5433.6±2134.06	41.67±4.54	8.29±0.49	10.5±2.26	13.99±1.07	16.32±1.04	0.06±0.02	55.06±12.34	29.08±11.81	9.95±3.07
ANOVA	4.46	0.97	1.22	0.98	0.78	0.41	2.06	4.21	0.24	0.14	0.59
P value	0.0015*	0.42	0.30	0.41	0.61	0.79	0.08	0.001*	0.91	0.96	0.66
Range	6.00-196.00	900-13500	30.00-58.00	5.70-10.40	8.6-13.2	11.80-18.20	14.10-18.90	0.012-0.84	29.00-90.00	7.00-63.00	1.00-39.00

Table IV shows thatparameter of dengue patient that had no comorbidities were mean platelet count 48.18,mean TLC 4240.25,mean HCT 42.65, mean MPV 8.18, mean HB 11.20,mean RDW 14.39, meanPDW 16.61, mean PCT 0.04, mean N% 58.45,L% 32.87,M% 8.58. Total 46 patients presented with comorbidities out of them 15patients were diabetic and there mean platelet count was 48.18,mean TLC was 4626.66, mean HCT was 40.62,mean MPV was 8.42,mean HB was 12.12,mean RDW was 14.53,mean PDW was 16.26,mean PCTwas 0.08 and mean N% 60.46,L% 31.40,M% 8.93. Total 5 COPD patient presented with dengue fever there mean platelet count 88.80, mean TLC 5040.00, mean HCT 43.94, mean MPV 7.72, mean HB 12.45, mean RDW 14.74, mean PDW 16.78, mean PCT 0.07, mean N% 55.60,L% 32.40, M% 12.00. Total 16 patient were hypertensive that had dengue syndrome there parameter were mean platelet count 65.54, mean TLC 5054.54, mean HCT 40.52, mean MPV 8.09, mean HB 11.80, mean RDW 14.34, mean PDW 16.17, mean PCT 0.07, mean N% 57.09,L% 33.90,M% 9.18. Two patients had CAD presented with dengue syndrome there mean platelet count 55.38, mean TLC 5493.33, mean HCT 40.96, mean MPV 8.83, mean HB 12.56, mean RDW 13.83, mean PDW 16.20, mean PCT 0.05, mean N% 58.66, L% 31.00, M% 10.33. Two pregnant females admitted with dengue syndrome there mean platelet count 50.22,mean TLC 5433.6,mean HCT 41.67,mean MPV 8.29,mean HB 10.5,mean RDW 13.99,mean PDW 16.32,mean PCT 0.06, mean N% 55.06,L% 29.08,M% 9.95.

DISCUSSION

The management of dengue virus infection is essentially supportive and symptomatic. No specific treatment is available.The patients are treated with paracetamol, oral rehydration and IV fluids according to WHO's guidelines.[7] Fluids to maintain hydration and medications to reduce fever and eliminate pain are often prescribed.[8] Aspirin should be avoided because it can decrease the blood's ability to clot. Severe case and those that progress to dengue hemorrhagic fever require hospitalization with intensive monitoring and treatment. Early recognition of shock, careful monitoring and appropriate fluid therapy has resulted in considerable reduction of mortality to one to five percent.[9]

WHO has reported an expansion of geographical distribution of both the virus and the mosquito vectors resulting in an increased frequency of epidemics thus making ground for hyperendemic areas.[10] There has been change in clinical presentation of Dengue fever recently. DHF is now among the commonest cause of hospitalization of children in south-east Asia.[11]

Majority (73.0%) patients represented with dengue fever whereas 25.8% patients were suffering from Dengue Hemorrhagic fever. Only 1.20% patients presented with dengue Shock Syndrome.There were 284 (77.6%) males and 82 (22.4%) females among 366 dengue cases. Among both sexes, maximum number of patients belonged to 16-25years age group (51.22% in females, 63.38% in males) followed by 26-40 years age group (23.17% in females, 24.30% in males) and 41-50 years age group (21.73% in females, 10.21% in males) & minimum proportion of patients were in 1-15 years &>60 years age group (~1% in females as well as males).Kabra et al[12]analyzed patients of DHF/DSS with severe thrombocytopenia for the benefit of platelet transfusion, they conclude that number of days of hemorrhage and outcome in these patients were not improved compared to control. We found thatthe mean platelet count was 50.67 with range of 6-196. Mean TLC was 4306.45 within a range of 900-13500. The mean hematocrit was 42.50 within a range of 30-58. Mean MPV was 8.19, mean PDW 16.38 and mean PCT 0.0479. We observed mean platelet count 48.18,mean TLC 4240.25,mean HCT 42.65, mean MPV 8.18, mean HB 11.20,mean RDW 14.39, meanPDW 16.61, mean PCT 0.04, mean N% 58.45,L% 32.87,M% 8.58. Total 46 patients presented with comorbidities out of them 15patients were diabetic and there mean platelet count was 48.18,mean TLC was 4626.66, mean HCT was 40.62,mean MPV was 8.42,mean HB was 12.12,mean RDW was 14.53,mean PDW was 16.26,mean PCTwas 0.08 and mean N% 60.46,L% 31.40,M% 8.93. Total 5 COPD patient presented with dengue fever there mean platelet count 88.80, mean TLC 5040.00, mean HCT 43.94, mean MPV 7.72, mean HB 12.45, mean RDW 14.74, mean PDW 16.78,

mean PCT 0.07, mean N% 55.60,L% 32.40, M% 12.00. Total 16 patient were hypertensive that had dengue syndrome there parameter were mean platelet count 65.54, mean TLC 5054.54, mean HCT 40.52, mean MPV 8.09, mean HB 11.80, mean RDW 14.34, mean PDW 16.17, mean PCT 0.07, mean N% 57.09,L% 33.90,M% 9.18. Two patients had CAD presented with dengue syndrome there mean platelet count 55.38, mean TLC 5493.33, mean HCT 40.96, mean MPV 8.83, mean HB 12.56, mean RDW 13.83, mean PDW 16.20, mean PCT 0.05, mean N% 58.66, L% 31.00, M% 10.33. Two pregnant females admitted with dengue syndrome there mean platelet count 50.22,mean TLC 5433.6,mean HCT 41.67,mean MPV 8.29,mean HB 10.5,mean RDW 13.99,mean PDW 16.32,mean PCT 0.06, mean N% 55.06,L% 29.08,M% 9.95.A study was conducted by Daniel et al[13] among 250 IgM dengue antibody-confirmed cases admitted to three major hospitals in Kollam city. The presenting symptoms were: fever (96.8%), headache (77.2%), abdominal pain (62.4%), diarrhoea (15.2%), bleeding (15.2%), skin rash (13.2%), pruritus (10.4%), sore throat (5.2%), and seizures (0.8%). The major physical findings noted included positive tourniquet test (33.67%), hepatomegaly (17.6%), bradycardia (16.8%), pleural effusion (13.2%) and ascites (12%). The most frequent abnormal laboratory findings included haemoconcentration (27.8%) and severe thrombocytopenia (<10000 in 8.5%). Eight out of 250 patients died (case-fatality rate (CFR) = 3.2%). In all the 8 cases of death, disseminated intravascular coagulation (DIC) was the cause of death. DIC was associated with thrombocytopenia (platelet count-50000/cmm) and haemoconcentration (7 out of 8 cases).

The limitation the study is small sample size.

CONCLUSION

Authors found that majority of patients represented with dengue fever followed by dengue hemorrhagic fever.

REFERENCES

1. Robinson M. An epidemic of virus disease in southern province, Tanganyika Territory, in 1952-53; I. Clinical Features. Trans Royal Society Trop Med Hyg 1955; 49(1):28-32.
2. Aggarwal A, Chandra J, Aneja S et al. An epidemic of dengue haemorrhagic fever and dengue shock syndrome in children in Delhi. Indian Pediatr 1998; 35: 727-32.
3. Cecilia D. National Institute of Virology, Golden Jubilee Publication. Dengue Reemerging Disease 2004; 4: 278-307.
4. Balaya S, Paul SD, D'Lima LV, Pavri KM. Investigations on an outbreak of dengue in Delhi in 1967. Indian J Med Res 1969; 5: 767-74.
5. Chaturvedi UC, Mathur A, Kapoor AK et al. Virological study of an epidemic of febrile illness with haemorrhagic manifestations at Kanpur, India during 1968. Bull World Health Organ 1970; 4: 289-93.
6. Nimmannitya S. Dengue hemorrhagic fever: diagnosis and management. Gubler DJ, Kuno G, eds. Dengue and Dengue Hemorrhagic Fever. Wallingford, United Kingdom: CAB International, 1997; 133–146.
7. Singh M. Medical emergencies in children. 4th Ed. New Delhi: Sagar Publications; 2004.
8. Dengue hemorrhagic fever, diagnosis, treatment, prevention, and control. III. Treatment. Geneva: World Health Organisation, 1997;24-33
9. Dengue: Guidelines for diagnosis, treatment, prevention, and control in sub-Saharan Africa and 13 countries in South America. Geneva: World Health Organization; 2009.
10. Halstead SB. The XXth century dengue pandemic: need for surveillance and res. World Health Stat Q 1992; 45 (2-3): 292-8.
11. Pande JN, Kabra SK. Dengue hemorrhagic fever and shock syndrome. Natl Med J India. 1996; 9(6): 256-8.
12. Kabra SK, Jain Y, Madhulika, Tripathi P, Singhal T, Broor S, Dar L, Seth V. Role of platelet transfusion in dengue hemorrhagic fever. Indian Pediatr. 1998; 35(5):452-5.
13. Daniel R, Rajamohanan, Phillip AZ. A study of clinical profile of dengue fever in Kollam, kerala, India. Dengue Bulletin 2005; 29:197-202