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A Study on the Clinicopathological Profile and Outcome of a Dengue Epidemic in Western Odisha.

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Abstract

Epidemics of Dengue fever have been reported in different parts of India at different times. In the year 2011, Odisha for the first time encountered a major epidemic of Dengue fever affecting almost half of the state.We have tried to evaluate 300 of these cases meticulously and compiled the information to better understand the various aspects of this disease.The present study highlights the importance of dengue fever to clinicians in the areas where it is seen less frequently.The clinical manifestations were similar to many other epidemics, but there were few differences.Though several organs are affected by dengue fever, outcome is not bad if platelet is given promptly. Dengue should be included as a differential diagnosis of all short duration fevers with or without gastrointestinal manifestations.

Keywords: Dengue, Epidemic, Clinicopathological Profile, Platelet.

Introduction

Dengue viruses (DV) belong to the family Flaviviridae and have four serotypes ((DEN-1, DEN-2, DEN-3 and DEN-4)[1]. They are transmitted mainly by the mosquitoes *Aedes aegypti* and *Aedes albopictus.*[1] The spectrum of clinical manifestations of dengue virus infections include subclinical infections, mild self-limiting diseases, or a severe disease (that may be fatal) like the dengue haemorrhagic fever/dengue shock syndrome (DHF/DSS)[1]. Dengue fever (DF) associated with dengue haemorrhagic fever (DHF) is an emerging public health problem in many countries. As per the recent WHO estimates, dengue is emerging at the rate of 390 million new infections per year[1]. Epidemics of Dengue fever have been reported in different parts of India at different times. In the year 2011, Odisha for the first time encountered a major epidemic of Dengue fever affecting almost half of the state. Patients from the western districts of Odisha come to VSS Medical College & hospital as this was the only tertiary institute in these areas having the facility for platelet transfusion until recently. So, almost all the detected cases of Dengue fever from western Odisha during the study period have been treated in this Institute. We have tried to evaluate these cases meticulously and compiled the information to better understand the various aspects of this disease.

Objective

To study the clinico-pathological manifestations, trend and outcome of all confirmed dengue cases admitted in a tertiary care hospital.

Material and Methods

It is a retrospective, observational study. 300 in-patients diagnosed with dengue from August 2011 to October 2011

in VSS Medical College & Hospital(presently VIMSAR), Burla were included in the study. Only those patients whose clinical presentation matched the prevalent WHO definition of dengue[2,3](during the period of the epidemic) along with a positive result with the Rapid Kit test (Mitra & Co.) or by ELISA were included in the study. Detailed history and a thorough clinical examination of each and every subject had been noted. All relevant investigations were done as per requirement and clinical manifestations.

Investigations done

In all cases, the Complete blood count(CBC), Peripheral blood smear, liver function test (bilirubin-total/direct/indirect,SGOT,SGPT,alkaline phosphatase, serum albumin and globulin), serum urea, serum creatinine, serum sodium, serum potassium, ESR(erythrocyte sedimentation rate), PT, INR, stool for occult blood, urine for routine microscopy, fasting blood sugar(FBS), MP QBC, MP ICT, chest xray PA view and USG (abdomen & pelvis) were carried out.**(Table e)**

According to the clinical indications, serum amylase and lipase, Hb electrophoresis, sputum examination (for cytology, gram staining, culture & AFB) , upper GI endoscopy NCCT(head) were done.

Sample collection

Routine hematological samples were collected at admission and other investigations were done according to the clinical presentation or progress of the disease.

Frequency of tests/ investigations

CBC or total platelet count along with hematocrit was repeated daily (twice daily when the TPC was< 100000 or patients exhibiting hemorrhagic manifestations).

Inclusion criteria

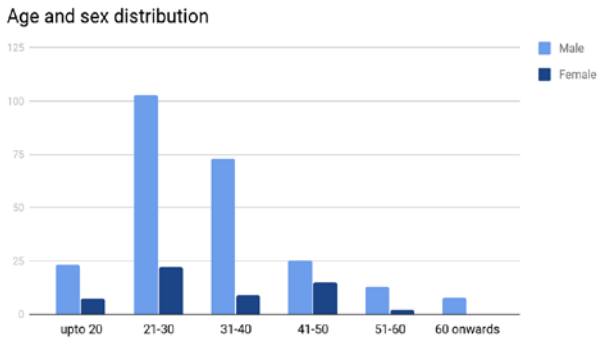
- Cases were included with positive IgM/IgG/NS-1 in rapid kit test or with a +ve ELISA for dengue along with a conformity to the WHO definition of Dengue at that time.
- All patients above the age of 15 years were included in the study.

Exclusion criteria

- No patient below 15 years of age was included in the study.
- Any patient with concomitant existing bleeding disorders, hemoglobinopathies, malaria, enteric fever were excluded from our study.
- Known cases of chronic infectious diseases (e.g. tuberculosis) were also excluded from the study.
- Patients who had refused to give consent for inclusion in any study / research were also excluded from the study.

Observation

(a) Bar graph 1: Age and Sex distribution of cases-



(b) Clinical Features

Symptoms	Number of cases	Percentage
Fever	**300**	**100**
Myalgia	**250**	**83.33**
Backache	**262**	**87.33**
Head ache	**188**	**62.66**
Loose motion	**30**	**10**

Abdominal pain	**49**	**16.33**
Retro-orbital pain	**14**	**4.6**
Pruritus	**84**	**28**
Rashes	**33**	**11**
Bleeding manifestations	**76**	**25.3**

(c) Spectrum of bleeding manifestations (Total 76 cases)-

Type of bleeding	Number of cases	Percentage
Purpura/petechiae	**15**	**19.7**
Melaena	**58**	**76.3**
Haematemesis	**3**	**3.9**
Epistaxis	**4**	**5.2**
Gum bleeding	**2**	**2.6**

(d) Complications

Types of complications	Number of cases	Percentage
Hepatopathy	**142**	**47.3**
Pleural Effusion	**6**	**2**
Ascites	**12**	**4**
Pneumonia	**10**	**3.33**
Acute Pancreatitis	**6**	**2**
Dengue shock syndrome	**13**	**4.3**
Acute renal Failure	**2**	**0.6**
Multi organ dysfunction	**2**	**0.6**

(e) Relevant Investigations

Investigations	Number Of Cases	Percentage
Leucopenia	**109**	**36.3**
Thrombocytopenia	**278**	**92.66**
SGOT (>3times)	**142**	**47.3**
SGPT (>3times)	**142**	**47.3**
Serum bilirubin (>2mg)	**66**	**22**
Raised Serum Amylase	**8**	**2.6**
Raised Urea and creatinine	**19**	**6.3**
Enlarged liver (ultra sound)	**30**	**10**

Enlarged spleen (ultra sound)	**8**	**2.6**
Inflamed pancreas (ultra sound)	**6**	**2**
Ascites (ultra sound)	**12**	**4**

(f) Relationship between platelet count and bleeding

Platlet Count	No. of cases	With bleeding	Percentage
<25000	19	12	63.1
25000-50000	56	20	35.7
50000-100000	126	41	32.5
100000-150000	44	3	6.8
> 150000	55	0	0
Total	300	76	25.3

(g) Hospital Stay

Hospital stay (in days)	No. of cases	Percentage
<5days	63	21
6-10days	174	58
11-15days	42	14
>15days	21	7

(h) Outcome

Outcome	No. of cases	Percentage
Uncomplicated recovery	88	29.3
Recovery with complication	208	69.3
Death	4	1.33

Result and Discussion

In this epidemic the most commonly affected age groups were 21-30 and 31-40 years. They constituted more than 70% of the cases. Very few cases were seen in elderly age group (>60years); it was just 2.7%.**(Table a)** An earlier study by Prasith et al concluded a predominance of 5-20 year age group.[4] This was probably due to the inclusion of paediatric patients in their study. Teixiera et al showed a gradual shift in the trend with a predominance of 15-21 year age group from an earlier older age group[5]. Cecilia D on the other hand corroborated our results in indian context with the higher incidence in 21-31 year old's.[6] Irrespective of the age the number of male cases far outnumbered the females.Our findings were similar to that of other previous studies.[8,9,10,11,12] Our patient pool was primarily from the lower socioeconomic strata with predominance of labourers/working class which may explain the higher male incidence(245 and 55 respectively). This may also be a reflection of the socio-cultural gender biased health seeking behaviour in our society. All these cases came from the western districts of Odisha, as this is the only institute in western Odisha having facility for giving platelets at the study period. The worst affected districts were Bargarh, Jharsuguda and Sambalpur. They contributed 88% of the total cases.

The clinical picture in dengue shows diverse manifestations from fever, myalgia to encephalopathy. In our series, all cases (100%) presented with fever. Back ache (87.3%) and myalgia (83.3%) were the other major

manifestations. Though headache was a very common presentation (62.7%), retro-orbital pain was observed in very few cases (4.6% only).Gastroenterological manifestations were found in a few cases. These were loose motion (10%) and abdominal pain (16.3%). Pruritus was seen in 84 cases (28%). It was common in extremities and abdomen; manifested towards the end of 1st week or early 2nd week of fever. It was more a sign of recovery than presentation.The basis of this pruritus is still not understood. Rash, mostly of maculo-papular variety, rarely pruritic, seen in extremities and trunk was found in 33 cases (11%). This was also found towards the end of first week of fever.CNS manifestation, considered to be a rare and atypical finding[13] was found in 8 (2.7%) cases**(Table b)**.Gupta et al reported a similar results with 100% presenting with fever, but a higher incidence of rash (36%) and retro-orbital pain(40%). Aswin kumar on the other hand reported 98% presentation with fever, a similar incidence of rash (19.1%) but a lower incidence of headache.(31%)

There were 76 cases (25.3%) who presented with bleeding manifestations.**(Table c/F)** Purpura and petechiae, a common manifestations of dengue was found in only 9(3%) of cases. However, Melaena was the commonest bleeding manifestation (58 cases). Bleeding from multiple sites was observed only in a few cases.

Various types of complications were seen **(table-d)**. These were- Dengue complicated with shock (DSS), hepatopathy, pleural effusion, ascites, Pneumonia, acute pancreatitis, acute renal failure, multi-organ dysfunction syndrome. Hepatopathy was the most common; seen in 142 cases. This was noticed either as frank jaundice and/or with raised liver enzymes.Aswin kumar reported dengue with pleural effusion to be their most common complication.

In regards to blood parameters, TPC was done daily, at times several times in a day in patients those presented with bleeding. Most of the patients had their initial haematocrit value in the lower side, but complicated cases presenting with DHF or DSS had high haematocrit value. The lower haematocrit value could be due to high prevalence of anaemia in this part of the country (iron deficiency and malaria).

The platelet count varied widely. The lowest recorded was 13000/cmm. The initial platelet count is given in table f.Majority had count between 50000-100000/cmm. It was observed that TPC remained normal in the initial phase of the illness. In majority of the cases TPC fell gradually from the initial normal level to the lowest by 5-8 days and returned back to normal by 7-10days. However in good number of cases there was wide fluctuation in the daily count. The haemorrhagic manifestations were more common in those who had lower count (table-f), but there were also patients who had bleeding symptoms even when the platelet count was normal. All the patients having bleeding manifestations were given platelet transfusion. However platelet transfusion was given to all who had a TPC below 50000.

A total no of 109 (38.3%) had leukopenia[10,7] (<4000/cmm). In the 142 patients (47.3%) had functional abnormality of liver. SGOT and SGPT levels were raised to >3 times the upper limit in all these cases, but serum bilirubin levels >2 was seen in 66(22%) cases only . A total of 8 cases (2.7%) had increased serum amylase and lipase level suggestive of acute pancreatitis. It was found that 23 cases (7.7%) had positive for malaria (PFR or PV) along with dengue. Renal dysfunction leading to acute renal failure was found 19 cases (6.4%). Those cases were treated conservatively. Only two patients required haemodialysis. CT scan was done in patients with encephalopathy; but did not reveal any abnormality.

Ultrasound in a number of cases revealed mild hepatomegaly, splenomegaly, inflammed pancreas and ascites in a few (table-e).

Relation of antigen and antibody pattern to clinical manifestations: in our series, most patients with significant platelet reduction or with complications are NS1+ve and IgM+ve, followed by NS1+ alone. Out of 300cases, 136(45.13%) are NS1+veand IgM+ve, 98(32.7%) are NS1+ve only, 46(15.3%) IgG +ve only, 18(6%) are IgM +ve, IgG +ve indicating secondary cases[13].

Majority patients(58%) had to stay for an average of 6-10 days period, 63 patients (21%) stayed for 1-5 days, 42 patients(14%) stayed for 11-15 days and 21(7%) stayed for >15 days on an average. Some patients insisted on staying in the hospital for a longer period even if their physical and haematological parameters were normal.**(Table g).** This was out of fear. The fear was that if required they will not be able to arrange platelet transfusion. Out of the 300 cases uneventful recovery was seen in 88 cases, 208 cases had some form of complications, but finally recovered without any residual deficit. Only 4(1.33%) patients died. Two died of dengue shock syndrome (DSS), one died of multi-organ failure, and one died of encephalitis**(Table h)**. Aswin reported 43.64% of patients staying 6-10 days.This group was also the biggest in our study.

India is one of the seven identified countries in the South-East Asia region regularly reporting dengue fever[14]. This epidemic occurred in August-October, implying post-monsoon surge as noticed by other study[15].Our study shows clear male preponderance in accordance with previous reports[15], most probably attributed to the increased outdoor activities in males. The maximum burden of the disease was reported among 21-30 years of age group, followed by 31-40 years, similar to previous reports[15,14] . This might be due to affliction of the working class. General myalgia and back pain constituted the commonest clinical manifestation. On other hand petechiae, purpura and retro-orbital pain were very uncommon in our study which was common in other studies[14,]. Melaena is the commonest bleeding manifestation in this study in contrast to cutaneous bleeding in other studies.[16,17] Melaena has also been observed as the commonest bleeding manifestation by Rachel Daniel et al.[17] CNS manifestation(2.7%) which is an atypical presentation was also detected in this study. Abnormal liver function[18,19] was the commonest non-haematological finding. Capillary leak syndrome causing ascites and/or pleural effusion were also seen though in less number. Dengue fever is the major pattern of presentation[15], followed by dengue haemorrhagic fever. In majority cases, the hospital stay was 6-10 days which coincides with other reports. There may be a possible association of this finding with occurrence of most of the complications in the late first week. Although thrombocytopenia was a common finding, but low count was always not associated with bleeding manifestations. Though very low TPC was associated with increased chance of bleeding, but there were cases who bled even with normal platelet count. So thrombocytopenia alone is probably not the cause of bleeding in Dengue.[18] Rapid fluctuations in the platelet count were noted in some of our patients. In serodiagnosis, most of the cases belong to NS1+ve and IgM+ve may be due to late referral of the cases from periphery hospitals. Platelet count was lowest at late first week of fever and recovers thereafter in 3-5 days. Most of the patients recovered with conservative treatment alone, only those with complications required specific treatment. Dengue shock syndrome is the commonest cause of mortality, but overall mortality rate is very less in accordance with other studies.

Conclusion

The present study highlights the importance of dengue fever to clinicians in the areas where it is seen less frequently. Due to rapid migration of people it is possible to have dengue epidemic in those places where it was otherwise unknown. Though it can start in industrialised area, but it can spread to non-industrialised areas within a short period. The clinical manifestations were similar to many other epidemics, but there were few differences. Interesting things to note was retro-orbital pain was uncommon; bleeding did not linearly correlate with the TPC. Wide fluctuation in the platelet count was observed quite often. Though several organs are affected by dengue fever, outcome is not bad if platelet is given promptly. Dengue should be included as a differential diagnosis of all short duration fevers with or without gastrointestinal manifestations.

References

[1]. Dengue and severe dengue [Internet]. world health organization. 2017 [cited 21 June 2017]. Available from: http://www.int/mediacentre/factsheets/fs117 /en.

[2]. Dengue fever Diagnostic Criteria - Epocrates Online [Internet]. Online.epocrates.com. 2017 [cited 23 June 2017]. Available from: https://online.epocrates.com/diseases/119736/Dengue-fever/Diagnostic-Criteria

[3]. Gupta P, Khare V, Tripathi S, Nag V, Kumar R, Khan M et al. Assessment of World Health Organization definition of dengue hemorrhagic fever in North India. The Journal of Infection in Developing Countries. 2010;4(03).

[4]. Prasith N, Keosavanh O, Phengxay M, Stone S, Lewis H, Tsuyuoka R et al. Assessment of gender distribution in dengue surveillance data, the Lao People's Democratic Republic. Western Pacific Surveillance and Response Journal. 2013;4(3):18-25.

[5]. eixeira M, Costa M, Coelho G, Barreto M. Recent Shift in Age Pattern of Dengue Hemorrhagic Fever, Brazil. Emerging Infectious Diseases. 2008;14(10):1663-1663.

[6]. Cecilia D. Current status of dengue and chikungunya in India. WHO South-East Asia J Public Health 2014; 3(1): 22–27.

[7]. Organization W. Dengue. Geneva: World Health Organization; 2009.

[8]. Sharma S, Sharma SK, Mohan A, et al. Clinical profile of dengue haemorrhagic fever in adults during 1996 - outbreak in Delhi, India. Dengue Bull 1998;22:20–7.

[9]. Acharya SK, Buch P, Irshad M, Gandhi BM, Joshi YK, Tandon BN. Outbreak of Dengue fever in Delhi. Lancet 1988;2:1485.

[10]. Singh NP, Jhamb R, Agarwal SK, et al. The 2003 outbreak of Dengue fever in Delhi, India. Southeast Asian J Trop Med Public Health 2005;36:1174–8

[11]. Pandey A, Diddi K, Dar L, et al. The evolution of dengue over a decade in Delhi, India. J Clin Virol 2007;40:87–8.

[12]. Sinha N, Gupta N, Jhamb R, Gulati S, Kulkarni AV. The 2006 dengue outbreak in Delhi, India. J Commun Dis 2008;40:243–8.

[13]. Sameer Gulati and Anu Maheshwari : Atypical manifestations of dengue, ,volume 12 no 9 pp 1087–1095 september 2007.

[14]. Ashwini Kumar, Chythra. Rao,et al. Clinical manifestations and trend of dengue cases admitted in a tertiary care hospital, Udupi district, Karnataka. Indian Journal of Community Medicine; July 1, 2010,35(3): 386–390.

[15]. PM Ukey et al: Study of Seroprevalence of Dengue Fever in Central India. Indian Journal of Community Medicine, Octo.2010. Vol. 35, Issue 4, P.517-519.

[16]. M. Emmanuel Bhaskar, SwathyMoorthy, et al. Dengue haemorrhagic fever among adults—an observational study in Chennai, south India;Indian Journal of Medical research / Dec, 2010.VOL. P.

[17]. Rachel Daniel: A Study of Clinical Profile of Dengue Fever in Kollam, Kerala, India ;Dengue Bulletin – Vol 29, 2005,197-202.

[18]. Sharma S and Sharma SK. Clinical profile of DHF in adults during 1996 outbreak in Delhi, India. Dengue Bulletin. 1998; 22: 20-27.

[19]. Srivenu Et Al, Profile Of Liver Involvement In Dengue Virus Infection. The National Medical Journal Of India Vol. 18, No. 3, 2005 127-130.