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A Study of Clinical and Epidemiological Profile of Dengue Fever in Tertiary Care Centre in Central India

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Abstract

Objective: *Dengue fever is most important arboviral disease in India and other tropical and subtropical countries with increasing prevalence in recent years with significant morbidity and mortality. This study was aimed to asses clinical & haematological features and outcome in central Indian adult population.*

Methods: *A cross-sectional observational study undertaken among adult patients admitted in a teaching hospital. 105 patients were analysed. All patients who were IgM-ELISA positive irrespective of their card test status were included in study. Clinical features and haematological, biochemical & radiological findings are noted.*

Results: *Total 105 dengue patients were included 22 ware of DF, 65 in DHF and 18 were DSS group. Male: female ratio was 1.14:1. Most common age group affected was 21-30 Yrs in 42.8 % cases. 60.5% cases were from urban area. 68.5% cases reported in month of September and October. Clinical features noted most common was fever (96.2%), myalgia (57.1%), headache (40%), vomiting(24%), retro-orbital pain (26.6%), abdominal pain(26.6%), patechie (34.2%), rash (41.9%), positive tourniquet test (56.1%). Major bleeding (25.7%), among them most common was gut bleeding. Complications like ARDS, resp. failure, encephalopathy, MODS were noted in DSS cases. Mean Hb% was 11.6 gm%, mean platelets count was 51286 /cumm. Platelets count 4000-1 lakhs in (63.8%) cases. Blood transfusion required in 43.8% cases. Coagulopathy was noted in 72.2% cases of DSS. Mean hospital stay was 7.43 days. No mortality was noted in our study.*

Conclusion: *Dengue is increased with increasing urbanisation & poor sanitation. Dengue has wide spectrum of clinical and haematological presentation. Significant mortality occurs in DHF and DSS. It is a low mortality illness if prompt diagnosis and proper fluid management instituted in DHF and DSS. Platelet transfusion has a little role in dengue management.*

Introduction

Dengue is the most common mosquito borne, endemo- epidemic arboviral infection in many tropical and sub-tropical regions of the world. It is the most rapidly spreading mosquito-borne viral disease in the world Dengue is an acute viral infection with potential fatal complications. Dengue causes a wide spectrum of illness from mild asymptomatic illness to severe fatal dengue haemorrhagic fever and dengue shock syndrome. Dengue is one disease entity with different clinical presentations and often with unpredictable clinical evolution and outcome[1].

Early prediction is very important to avoid unnecessary hospitalization to those with non severe dengue that are predicted to progress into

severe dengue. Awareness of clinical presentations and complication may be helpful in arriving early diagnosis and avoid morbidity and mortality. In present study there is a attempt to collect data of adult population coming to a tertiary care hospital with dengue fever and compilation of various clinical manifestations and laboratory findings[2].

According to National vector control programme, total cases in India in 2013 were 75808 out of which 193 died, in 2014 it was 40571 and 137 died ,in 2015 total 99913 cases reported and 220 deaths, July 2016 total 36110 total cases and 70 deaths reported .In MADHYA PRADESH in 2013 ,1255 cases out of which 9 died, in 2014 , 2131 out of which 13 died, in 2015 total 2108 cases out of which 8 died and on July 2016 354 cases reported out of which 1 died[3].

Methodology

This cross-sectional observational study was carried out in Department of Medicine; GANDHI MEDICAL COLLEGE and associated 1200 bed Hamidia Hospital, Bhopal from March 2015 to july 2016. This study covered the population of Bhopal and its neighbouring districts.

After detailed history and clinical examination, all the clinically suspected cases of dengue infection aged 12 years and above admitted in medicine wards and ICU were screened and IgMelisa positive confirmed cases (irrespective of antigen positivity) were included in this study. Patients with coexisting other febrile illness like malaria, leptospirosis, chikengunya typhoid, pneumonia were excluded from study. Patients were categorized into classical dengue fever, dengue heamorhagic fever and dengue shock syndrome according to WHO guidelines. was done for all the cases. Data collection of all study subjects was done in structured data collection forms.

All the cases were subjected to Dengue IgM was done using the IgM capture ELISA kit,NS1 ag (if available), CBC ,Hb, TLC, DLC, platelet count, heamatocrit by automated coulter counter method and peripheral smear for mp, Liver function test-, ALT, AST by using Autozyme GPT and Autozyme GOT reagent respectively. Alkaline phosphatise by kinetic method. Serum albumin by the BCG Dye binding method, total serum bilirubin by colorimetric method, Renal function test- urea, creatinine, PT and INR were done to assess the coagulation profile. Coagulopathy was defined as INR > 1.5 or PT> 15 sec, widal test- by tube method, Chest X-ray was carried out to check for pleural effusion and features of ARDS and other lung pathology, Ultrasonography of abdomen was done to assess liver size and ascites gall bladder wall thickness and spleenomegaly. Blood counts were monitored periodically during hospital stay other possible differential diagnoses were excluded using available appropriate laboratory tests and clinical findings. Ethical committee clearance were taken before commencement of study and a informed consent was taken from each participants.

Results

Total 105 dengue patients were included 22 ware of DF, 65 in DHF and 18 were DSS group. Male: female ratio was 1.14:1. Most common age group affected was 21-30 Yrs in 42.8 % cases. 60.5% cases were from urban area. 68.5% cases reported in month of September and October. Clinical features noted most common was fever(96.2%), myalgia (57.1%), headache(40%), vomiting(24%), retro-orbital pain (26.6%), abdominal pain (26.6%), patechie (34.2%), rash (41.9%), positive tourniquet test (56.1%). Major bleeding (25.7%), among them most common was gut bleeding .Complications like ARDS, resp. failure, encephalopathy, MODS were noted in DSS cases. Mean Hb% was 11.6 gm%, mean platelets count was 51286 /cumm. Platelets count 4000-1 lakhs in (63.8%) cases. Blood transfusion required in 43.8% cases. Coagulopathy was noted in 72.2% cases of DSS. Mean hospital stay was 7.43 days. No mortality was noted in our study.

Distribution of Clinical features in study population

Symptom/SIGNS	TOTAL N=105	
	Cases	%
Fever	101	96.2
Bodyache	60	57.14
Major Bleeding	27	25.71
Petechiae	36	34.28
Abdominal pain	28	26.66
Headache	42	40
Retro-orbital pain	28	26.66
Vomiting	24	22.85
Oedema	25	23.81
Rash	44	41.90
Jaundice	09	8.57
Hepatic tenderness	32	30.47
Tourniquet test Positive	59	56.19
Ascites	07	6.66
Pleural effusion	15	14.28
Shock	17	16.19
Renal failure	20	19.04

Age-wise distribution of study population

Age group (yrs)	DF N=22		DHF N=65		DSS N=18		TOTAL N=105	
	Cases	%	Cases	%	Cases	%	Cases	%
13-20	6	27.27	21	32.31	03	16.66	29	27.62
21-30	13	59.09	24	36.92	08	44.44	45	42.86
31-40	01	4.54	10	15.38	02	11.11	13	12.38
41-50	02	9.09	7	10.7	02	11.11	11	10.47
51-60	00	00	2	3.07	02	11.11	04	3.80
Above 60	00	00	01	1.53	01	5.55	02	1.90
Total	22	100	65	100	18	100	105	100

Distribution of study Population as per Residential Area

AREA	DF N= 22		DHF N= 65		DSS N=18		TOTAL N= 105	
	Cases	%	Cases	%	Cases	%	Cases	%
Rural	11	50	25	38.46	5	27.78	41	39.05
Urban	11	50	40	61.54	13	72.22	64	60.95
TOTAL	22	100	65	100	18	100	105	100

Distribution of patients according to month of admission

Month of admission	DF N=22		DHF N=65		DSS N=18		TOTAL N=105	
	Cases	%	Cases	%	Cases	%	Cases	%
January- February	00	0	00	0	01	5.55	01	0.95
March – April	00	0	00	0	00	0	00	0
May- June	0	0	00	0	00	0	01	0.95
July- august	00	0	03	4.61	01	5.55	04	3.80
September-October	12	54.55	47	72.31	13	72.22	72	68.57
November-December	09	40.91	15	23.07	03	16.66	27	25.71
Total	22	100	65	100	18	100	105	100

Discussion

Increase in the number in dengue cases over past few years has been noted which can be attributed to rapid unplanned urbanisation and poor sanitation facilities contributing fertile breeding areas for mosquitoes. Total 105 cases of IgM-ELISA positive dengue fever admitted in Gandhi medical collage & Hamidia hospital during the study period included and epidemiological, clinical features, laboratory findings, complica-tions & outcome of these patients has been described. In our study 20.95 % classified as classic dengue, 61.9% as dengue haemorrhagic fever and 17.14 % as dengue shock syndrome . As only hospitalised patients were included in this study patients having classic dengue haemorr-hagic fever were more than that classic dengue.

Demography

Male: female ratio was 1.14:1 in our study Rachel Daniel et al[5]. Reported 1.08: 1 ratio, dr. Mohan et al[7] reported 1.17:1 ratio, Rajesh deshwal et al[6] reported 2.67: 1 ratio among males and female .male predominance may be due to greater vulnerability males for mosquito bite due to outdoor work. The commonest age group in our study was 21-30 yrs. Dr. Mohan et al[7] reported 15 – 40 yrs to affected more, Rachel Daniel et al[5] found nearly equal distribution among 12- 50 yrs, Rajesh deshwal et al[6]. reported maximum patients in 21- 40 yrs. At our hospital patients coming from urban areas was 60.95%.

Clinical presentation

Maximum cases was admitted in post monsoon season 68.57% in September to October and 25.71 % in November to December .This highlights the relation between post monsoon water stagnation and dengue infection. preventive measures should focus on water stagnation in post monsoon season as concluded by Dr Mohan et al[7]. Fever was most common presentation 96.2% in present study similar studies by Rajesh deshwal et al[6]reported in 94.75%, Dr.mohan et al[7] in 100 %, and Rachel Daniel et al in 96.8 % cases, sanjay kumar mandal et al[8] in 100 % cases. Bodyach / myalgia presented in 57.14% in present study, dr. mohan et al[7] in 90% cases Rajesh deshwal et al[6] reported in 90.8 % cases.

Vomiting and abdominal pain in dengue can due to hepatitis, bowel wall ischemia or mesenteric lymphadenitis, in our study it was present in 22. 85% and 26.6% cases respectively. Rajesh deshwal et al[6] reported in 5.4 % and Dr. mohan et al[7] in 54% so presentation with vomiting is of variable phenomenon. Retro-orbital pain was in 26 .66 % in our study but rajesh deshwal et al[6] in 18 3 % cases. Rash was presented in 41.9% in our study, Rachel Daniel et al[5] reported in 33% Rajesh deshwal et al[6] in 37.9 % dr. Mohan et al in 20 % cases. positive tourniquet test seen in 56.19% cases in present study, while Rachel Daniel et al[5] reported in 33.67% cases, Rajesh deshwal et al[6] in 16% % cases. In our study Headache was seen in 40 % cases, Rajesh deshwal et al[6]reported in 94.8 % cases sanjay kumar mandal et al[8] in 62.16 % cases drmohan et al[7] in 90% cases. petechie was seen in 34.28% cases Dr Mohan et al reported in 21% cases .Bleeding is common in dengue due to low platelet count and capillary leakage. Major bleeding manifestations were noted in 25.71 % cases includes gum bleeding, gut bleed, per vaginal bleed, haemoptysis, intracranial bleed, heamaturia. Rachel Daniel et al[5] in 15. 2 % cases Rajesh deshwal et al[6] in 5.4 % Dr Mohan et al[7] in 18 % cases Sanjay kumar mandal et al[8] in 13.51 % cases.

Heamatology

In our study mean platelet cunt is 51286 /cumm platelet count, 40000-100000 noted in 63.81 % cases, < 20000 in 16.19% cases and > 100000 /cumm platelets count found in 3.80%. Rachel Daniel et al[53]. found < 10000 /cumm in 8.6% cases, <50000/cumm in 47.4 % . Rajesh deshwal et al[6] noted platelets < 50000 /cumm in 59.51% cases. Sanjay kumar mandal et al[8] noted platelet count < 50000 i 37.84% and > 50000 in 62.16 % cases.

heamatocrit>45 % noted in 14.8 % cases present study. Rachel Daniel et al[5] reported in 27.9% cases, sanjay kumar Mandal et al[8] reported in 21. 62 % cases Rajesh deshwal et al[6] noted in 20. 77%. mean haemoglobin among study population was 11.61 gm% in our study population. 43.81% cases required blood products transfusion during their hospital course. Frequency of blood transfusion does not seems to be affected by low platelets count as bleeding manifested in subjects having count >50000 – 100000 also .Hepatic involvement was present in majority of cases in our study, we found serum ALT >45 in 22.85% cases and AST >45 seen in 19. O4%cases. Deranged INR(>1.5) noted in 11.42 % cases. rise in serum transaminases and coagulopathy was more in group of severe dengue as compared to dengue fever with warning signs and dengue fever without warning signs . In a study done by Amrita et al[9] more than 10- fold increase in the levels of AST and ALT were observed mainly in dengue with warning signs (10.7%) and severe dengue (21.3%). There was 84.4% and 93.75% ALT and AST elevation respectively in dengue with warning signs and 94.5% and 95.9% ALT and AST elevation respectively in severe dengue and fulminant hepatic failure was observed in severe dengue

In our study mean hospital stay was 7.4 days. 60.95% patients had stay 7-14 days. Stay was expectedly higher in severe dengue cases.

On usg- abdomen hepatomegaly was found in 42.86% cases, Rachel Daniel et al reported in 17.6 % cases. gall bladder wall thickening found in nearly 40.95% cases in present study . in present study Ascites found in 17.14 % cases, Rachel Daniel et al[5] reported in 17.6%, Rajesh deshwal et al[6] recorded in 16.31% cases.

No mortality was seen in our study, Rachel Daniel et are ported 3.2% mortality dr Mohan et al[7] reported 11% while, Rajesh deshwal et al[6] reported 0.77 % deaths. Mortality can be reduced by early and prompt diagnosis and active and timely interventions in suspected dengue cases .presence of other co-morbidities does not seems to affect outcome in dengue cases in our study.

Complications like ARDS, respiratory failure, encephalopathy, myocarditis, multi organ dysfunction observed in present study population was present in 9.52% cases which were seen in severe dengue cases .dr. Mohan et al reported 52 % cases to have complications.

Statistical analysis among demographic data, sign /symptoms and haematological parameters of dengue fever according to severity of dengue was done using appropriate tests p-value was found insignificant due to small sample size.

Limitations of present study was to have small sample size, interfering in making prompt and clear picture about clinical manifestations in dengue patients coming to our hospital. another limitations is to leaving all out-patient department cases . Also entomological data was not collected . NS1 ag was not taken as selection criteria instead of that only IgM ELISA positive included as NS1ag was not available at our hospital. Strategies to prevent dengue by government agencies should focus on awareness of signs and symptoms of dengue among general population. further studies on broad scale needs to be done in future to understand dengue in more depth and to asses predictors of mortality and morbidity and residual effects on organs involved and to draw more specific management and prevention strategies.

Conclusion

Dengue fever patients has significant morbidity in form of various symptoms and complications. Not so much difference found in distribution of symptoms and their relation with morbidity and outcome. Coagulopathy, liver dysfunction and prolong hospital stay and various complications occurs more in severe dengue patients compared to other groups. Dengue infection is increasing with increased urbanisation and poor sanitation measures. Dengue has a wide spectrum of clinical and haematological presentation. It presents with fever, headache, bleeding, retro-orbital pain, vomiting and abdominal pain and many other

symptoms and signs. Significant morbidity occurs in dengue with warning signs and severe Dengue. It is a low mortality illness if prompt diagnosis and treatment can be instituted on time. Proper fluid management is the most important in management of dengue haemorrhagic fever. Platelet transfusion have little role in management of dengue. Further large scale studies are required to understand more about dengue in terms of prediction of outcome on presentation.

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