Clinical Spectrum of Dengue in a Tertiary Care Hospital of Northern Bangladesh

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Abstract:

Background: Dengue is an emerging major infectious disease which causes frequent outbreaks affecting millions. The complex interplay between virus serotype, host immune response and environmental factor set a series of changes in dengue presentation over the years.

Materials and method: This was a cross-sectional, observational study conducted on 100 diagnosed dengue patients attending a tertiary teaching hospital. The study participants were divided into severe and non-severe categories and compared in terms of their symptoms, severity and lab findings. Statistical analysis was done using SPSS.

Result: Majority of the study participants were younger. Female participants were more than male. Apart from fever, headache was found to be the commonest symptom in general. Epistaxis and melaena were significantly higher among severe group than non-severe peers. Gastrointestinal symptoms were frequently present among both groups.

Conclusion: Most of the cases of dengue patient didn't suffer from life threatening infection but when the infection is severe, bleeding manifestation can be a predictor of the onset of critical illness.

Introduction:

Dengue has emerged as the most rapidly spreading infectious disease around the world and its impact is so grievous that it is considered as one of the top global health threats by World Health Organization (WHO). Since its wild spread back in 2000, dengue has become an emerging infectious disease in Bangladesh[1]. It claims so many lives each year and thus has become a major disease burden now-a-day. Although dengue is not a novel problem in world stage but it is relatively a newer threat to us that we have failed to contain so far. Health care professionals have become much more experienced in treating patients suffering from Dengue with their clinical acumen aided by national and international recommendations. Still, we are experiencing continuing death toll and morbidity that puts a heavy stress on already a strained healthcare system each year[2]. Apart from high fever, the obvious feature of this problematic vector borne disease, we have seen significant change from time to time in other manifestations of dengue. To make things worse, dengue can and frequently do co-circulate in the community with seasonal flu that can make diagnostic dilemma and delayed treatment[3]. Early diagnosis of dengue is of paramount importance as it may help to start close vigilance of the course of the disease and allow us to intervene timely to prevent severe complications. So, it is really vital for every physician to get accustomed with the common and uncommon presentations of dengue to promptly diagnose or suspect in its earlier stage. The current study aims to share the symptomatic variance of dengue fever based on the experience of the authors in the peak of yet another dengue epidemic in a tertiary teaching hospital setting.

Materials and Methods:

This was an cross-sectional study conducted on diagnosed patients with dengue infection who were treated either as outpatient or inpatient in the Department of Medicine at Ad-din Sakina Women's Medical College Hospital, Pulerhat, Jashore.

A total of 100 patients were enrolled in this study on the basis of convenience sampling from April to August 2023. Informed written consent was taken from each participant.

Inclusion criteria: Adult male or female patients who had presented with complaint of fever and were found to be non-structural protein (NS1) positive or Anti dengue antibody IgM positive were included in the present study.

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Exclusion Criteria: Unwilling patient, Anti dengue IgG positive but NS1 or IgM negative patients, patients who are below 18 years old, patient with any significant comorbidity were excluded.

A detailed history was taken and elaborate bedside examination was performed in every cases. Pertinent investigations were performed according to the clinical need of the patients. All participants were classified by severity using WHO criteria and symptomatically according to National Guideline, Bangladesh 4th Edition. Based on severity Dengue patients were divided into three distinct categories: Group A(Dengue), Group B (Dengue with warning sign) and lastly Group C (Severe Dengue). The group A and group B are regarded as non-severe and Group C as severe group. Symptomatically participants were grouped into four types: dengue fever (DF), dengue haemorrhagic fever (DHF), dengue shock syndrome (DSS) and expanded

dengue syndrome (EDS). Data were compiled and analysed using the Statistical Package for Social Sciences (SPSS, IBM inc.) version 25 (2018). Descriptive statistics were reported as percentage and means when applicable along with standard deviation. Chi-square test and t-test were used to derive statistical inference for categorical and continuous variables respectively.

Result:

Majority of the participants were female (67%) and most of the cases were from rural areas (52%). The mean age of the participants was 33 years with a range of 19 to 77 years. While dengue fever (DF) was the main bulk of the study participants (51%), there were substantial cases of dengue haemorrhagic fever (DHF) (42%) with evidence of plasma leakage. Few cases had dengue shock syndrome (DSS) (4%) and expanded dengue syndrome (3%). (Table 1)

Table-I

Characteristics of study population (n=100)					
Variables	categories	Total	Non-severe	Severe	P value
Total n (%)		100	71 (71%)	29 (29%)	
Age in years	Mean (SD)	33±6.9	37.5±7.71	41.65.3	<0.001
Age Group	18-40	55%	45%	10%	
	40-65	31%	18%	13%	
	>65	14%	8%	6%	
Gender	Female	67%	47%	20%	0.368
	Male	33%	24%	9%	
Residence	Rural	52%	38%	14%	0.04
	Urban	48%	33%	15%	
Severity	Group A	55%	36%	19%	
	Group B	38%	31%	7%	<0.001
	Group C	7%	4%	3%	
Symptomatically		DF	39%	36%	3%
		DHF	33%	25%	8%
<0.001					
		DSS	19%	7%	12%
	EDS	9%	3%	6%	

P value was determined by chi-square test and independent sample t-test as appropriate

Apart from the cardinal presentations of fever, common presenting feature was dominated by gastrointestinal manifestations like vomiting (84%) and diarrhoea (23%). Other features included headache (87%), backache (81%), retro-orbital pain (39%), lethargy (73%), anorexia (71%), abdominal pain (48%), skin rash (29%) etc. Joint pain was found in 38% patients. 57% patients had some sort of haemorrhagic manifestation like epistaxis (16%), gum bleeding (13%), melaena (11%) and haemoptysis (7%). There was quite a frequent symptom overlap between severe and non-severe cases. Melaena and epistaxis were significantly associated with severe disease manifestation.

Common features in patients with plasma leakage includes positive torniquet test (32%), pleural effusion (29%) and ascitis (26%). Those who had dengue shock syndrome manifested cold clammy skin (89%), low blood pressure (100%), rapid and thready pulse (100%), narrow pulse pressure (92%) and low urine output (86%) (Table II).

Laboratory investigations of the study subjects showed that most of the patients (87%) had thrombocytopenia ($<1,50,000/mm^3$) on admission and leucopenia ($<4000/mm^3$) was found to be present in high percentage (92%) too. Haematocrit (Hct) increment of more than 20% from baseline was found in 17% patients. (Table 3)

Table-II

Clinical manifestation of patients (n=100)				
Variable	Total	Non severen	Severen	P value
Total 100	71(71%)	29(29%)		
Fever 100	71%	29%		
· Duration of fever	5.6±2.8	5.2± 2	6.4±3.9	0.062
· Highest recorded temperature	103.3±1.4	103.2±1.6	103.5±1.8	0.091
Headache	87%	45%	42%	0.528
Backache	81%	41%	40%	0.254
Retro-orbital pain	39%	21%	18%	0.896
Lethargy	73%	36%	37%	0.931
Vomiting	84%	51%	33%	0.765
Diarrhoea	23%	13%	10%	0.842
Epistaxis	16%	5%	11%	0.001
Melaena	11%	2%	9%	0.001
Gum bleeding	13%	7%	6%	0.325
Serosal fluid collection	55%	28%	27%	0.216
Oliguria/ anuria	14%	3%	11%	0.001

P value was determined by chi-square test and independent sample t-test as appropriate

Table-III

Investigation Profile of study population				
Variable	Totaln	Non-severen	Severen	P value
Leucopenia	87%	42%	45%	0.128
Thrombocytopenia	92%	47%	45%	0.217
Increased Hct	17%	8%	9%	0.413

P value was determined by chi-square test

Discussion:

Dengue fever, also known as breakbone fever for the intense musculoskeletal pain that it may produce, is a vector borne viral disease. The four serotypes of virus (DENV 1,2,3,4) are transmitted by Aedes mosquito[4]. All four serotypes are prevalent among Bangladeshis but up until 2002[5,6] DENV 3 was the predominant type which re-emerged as the dominant treat again on 2018[7]. Amidst this period DENV 2 and 3 were major circulating type causing outbreaks[8]. This infectious disease has been the matter of concern worldwide for many years now because of its large geographic distribution and the public health disaster that it brings annually. World health organization (WHO) estimate shows that most of the dengue case burden is affecting the western pacific and southern asia[9]. Presentation of dengue varies widely among its sufferer. Some patients may experience asymptomatic infection while others may have flu like symptoms. Those who have fever suggestive of dengue may have accompanying headache, retro-orbital pain, backache and many other systemic features like vomiting, diarrhea, organ involvement etc. Patients who have features of plasma leakage are said to have dengue hemorrhagic fever that may or may not be associated with shock. If sign symptoms of shock are present the condition is then called dengue shock syndrome[10]. In our study we have found that, majority of the dengue afflicted patients are young which is on par with the other studies done[11]. This can be explained by the outgoing nature of this age group for earning livelihood and household chores that makes them more vulnerable to the mosquito bite. But when it boils down to the severity outcome it is the more aged that suffers at a significantly higher rate. 67% of the total study subjects were female and they also predominantly suffered from more severe form of dengue but we have not found the difference to be statistically significant. Fever was found to be more prolonged among severe cases than non-severe group although the difference was insignificant. Headache was the commonest symptom found in our study which didn't vary quite much among the two comparing groups. Gastrointestinal symptoms were commonly found complain among sufferers and vomiting far superseded diarrrhoea. Our study revealed a higher proportion of gastrointestinal symptoms than similar previous studies in near past[12,13]. The commonest bleeding manifestation were epistaxis and melaena which is consistent with other studies[14]. These bleeding manifestations were significantly more common among severely affected study subjects which is also on par of recent studies[15]. Reduced or absent urinary output and cold clammy skin as part of shock presentation were expectedly higher among severe groups which was statistically significant.

Leucopenia was found in higher proportion than thrombocytopenia on admission although these lab parameters did not vary significantly among two comparing group of participants. Increased haematocrit was not a helpful distinguishing feature among two groups either. That might be partially explained by the timing of investigation as it was shown in previous studies that, within first 4 days of presentation the discriminatory value of haematocrit is low[16].

Our study had several limitations. The sample size was small and the study is a single center study. We selected our patients based on non-random convenience sampling which is more prone to bias. We couldn't include more parameters in the study that could provide more detailed insight about the evolving dengue outbreak during this season. Last but not the least the cross-sectional study nature makes the association of symptoms and severity general.

Conclusion

Our study showed that the previously attached classic "breakbone" phenomena is changing to accommodate symptoms involving many systems particularly gastrointestinal system in the current attack. We recommend to keep dengue as one of the potential differential diagnoses in any patient with febrile illness during outbreak. Moreover, we should be vigilant while treating a dengue patient who has overt bleeding as it may culminate into a serious outcome.

Conflict of Interest: None

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