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Original Article

Demographic Profile of Dengue Patient with Comorbidities in 100 Patients in A Tertiary Care Hospital, Bangladesh

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Abstract

Background: In the past decades, incidence of dengue has grown rapidly. There are four types of viruses (DENV-1, DENV-2, DENV-3, DENV-4) belonging to the Flaviviridae family. These mosquitoes breed in areas with standing water, including puddles, water tanks, containers and old tires. Lack of reliable sanitation and regular garbage collection also contribute to the spread of the mosquitoes. Each year, thousands of dengue infections are reported and there are several outbreaks of dengue in several countries including Bangladesh and this imply the global importance of this infection.

Objective: To assess the demographic profile of dengue patient with comorbidities in 100 patients in a tertiary care hospital.

Methods: A prospective study was done at Department of Medicine, Uttara Adhunik Medical College and Hospital, Uttara, Dhaka, Bangladesh from January 2023 to June 2023. Written consent was taken before including the subject to the study. The study included 100 patients who consented to be a part of the study. The patients were subjected to detailed history and clinical examination. Data were collected from hospital records. All the relevant data regarding history and examination findings of the patients, the laboratory reports were collected. Statistical package for social science (SPSS) version 22, was used for data entry and statistical analysis.

Results: Total 100 dengue patients were enrolled in this study. Mean age of all patient was 34.62±16.22 years (12-75 year) with male predominance (54%). Maximum patients were from urban residence (84%), non-smoker (73%), had active lifestyle (63%) and normal body mass index (69%). Overall, 65% patients had no comorbidity and 89% had no concurrent acute illness.

Conclusion: Although the results of this study cannot be generalized to other cities of Bangladesh, our findings willallow public health agencies in Bangladesh to concentratetheir efforts to battle against dengue.

Keywords: Dengue Fever, Clinical Findings, Presenting Complain.

Introduction

In the past decades, incidence of dengue has grown rapidly. The current estimate by World Health Organization (WHO) is 50–100 million cases of dengue infection per year [1]. Dengue is an important tropical infection caused by an arbo-virus. There are four types of viruses (DENV-1, DENV-2, DENV-3, DENV-4) belonging to the Flaviviridae family. The viruses are transmitted through the bite of infected Aedes aegypti and Aedes albopictus female mosquitoes that feed both indoors and outdoorsduring the daytime (from dawn to dusk). These mosquitoes breed in areas with standing water, including puddles, water tanks, containers and old tires. Lack of reliable sanitation and regular garbage collection also contribute to the spread of the mosquitoes. The Aedes aegypti mosquito, the principal vector involved in the transmission of the debilitating human viral disease dengue, which sometimes manifests as life- threatening dengue

haemorrhagic fever, has an additional climate-related limitation in that it prefers clean water in which to breed. Satisfying this predilection requires either or both exposure to recent rainfall and close proximity to human habitation [2]. It is a self-limited arboviral infection characterized by fever with rash, joint pains, nausea, vomiting, headache, and retroorbital pain. The courseof illness is divided into three phases – febrile, critical, and recovery phase. The critical phase occurs toward the late febrile phase (after 3rd day of fever) or around defervescence (usuallybetween 3rd and 5th day of illness but may go up to the 7th day) and the patient may manifest with thrombocytopenia and increase in hematocrit. Critical phase may progress to serious manifestations like dengue hemorrhagic fever (DHF) and dengue shock syndrome (DSS). Each year, thousands of dengue infections are reported and there are several outbreaks of dengue in several countries including Bangladesh and this imply the global importance of this infection. Dengue occurs in urban and suburban settings with higher transmission rates happening during the rainy season. In some cases, dengue infection is asymptomatic – persons do not exhibit symptoms. Those with symptomsget ill between 4 to 7 days after the bite. The infection ischaracterized by flu-like symptoms which include a sudden high fever coming in separate waves, pain behind the eyes, muscle, joint, and bone pain, severe headache, and a skin rash with red spots. The largest number of dengue cases ever reported globally was in 2019. All regions were affected, and dengue transmission was recorded in Afghanistan for the firsttime. High number of cases were reported in Bangladesh (101,000), Malaysia (131,000) Philippines (420,000), Vietnam (320,000) in Asia [3]. Dengue fever has re-emerged as a major public healthchallenge worldwide, with 2.5 billion people at risk of infection, more than 100 million cases and 25000 deathsbeing reported annually [4]. However, some outbreaks present uncommon clinicalpresentations, might be problematic in diagnoses. Theseverity of infection varies in different outbreak. The mortality in different outbreaks are usually different. The medical facilities and skill of local practitioner important determinants of outcome of dengue case management. It is also been influenced by fields such as economy, health system and environmental indices.This highlights the need of the knowledge on demography of dengue illness. As per WHO 2007 criteria, patients may be labeled as having dengue fever (DF), DHF, DSS. As per the new terminology recommended by WHO in 2009, the cases are classified into dengue without warning signs, dengue with warning signs (abdominal pain/persistent vomiting/mucosal bleed/increase in hematocrit with decrease in platelet count), and severe dengue (severe plasma leakage,severe bleeding, and severe organ involvement) [5]. The incidence of dengue has grown dramatically aroundthe world in recent decades. A vast majority of cases areasymptomatic or mild and self-managed, and hence the actual numbers of dengue cases are under-reported. Many cases are also misdiagnosed as other febrile illnesses [6]. The disease severity may vary from mild fever, which does not require hospitalization, to severe disease with features of DHF/DSS, which may require intensive care for the patient. Several discharge criteria have also been established for optimum patient care and to avoid unnecessary prolonged hospitalization. Except it, public health management like a vector control program, awareness regarding preventionand regular surveillance are very important.

Materials and Methods

A prospective study was done at Department of Medicine, Uttara Adhunik Medical College and Hospital, Uttara, Dhaka, Bangladesh from January 2023 to June 2023**.** Written consent wastaken before including the subject to the study. The study included 100 patients who consented to be a part of the study. The patients were subjected to detailed history and clinical examination. The diagnosis of dengue was confirmed by either Dengue NS1 antigen or IgM Dengue serology (ELISA). The patients were subjected to routine investigations. The plateletcounts were closely monitored. Lactate dehydrogenase (LDH) levels were done on the day of minimum platelet counts. The duration of symptom onset, date of admission, and duration of hospital stay were recorded. The calculated date of discharge based on the LDH levels was then compared with the actual date of discharge of the patient from hospital. They were discharged when their platelet count showed significant rises in three consecutive samples. Cases showing only IgG positivity and patients with concomitant diseases such as diabetes, cardiac disease, renal disease, hematological disorders, acquired immune deficiency syndrome, and malignancy were excluded from this study.

Data were collected from hospital records. All the relevant data regarding history and examination findings of the patients, the laboratory reports were collected. Statistical package for social science (SPSS) version 22, was usedfor data entry and statistical analysis.

Results

Total 100 dengue patients were enrolled in this study.Mean age of all patient was 34.62±16.22 years (12-75 year) with male predominance (54%). Maximum patientswere from urban residence (84%), non-smoker (73%),had active lifestyle (63%) and normal body mass index(69%). Overall, 65% patients had no comorbidity and 89% had no concurrent acute illness (Table 1).

Table I: Demographic profile of dengue patients (n=100)

Variables	n (%)/ Mean±SD
Age (in years)	34.62±16.22
<21	17 (17)
21-30	33 (33)
31-40	15 (15)
41-50	16 (16)
51-60	10 (10)
>60	9(9)
Gender	
Male	55 (55)
Female	45 (45)
Residence	
Rural	16 (16)
Urban	84(84)
Education	
Nil	4 (4)
Primary	5 (5)
Secondary	16 (16)
Higher secondary	31 (31)
Graduate and above	44 (44)
Occupation	
Unemployed	1 (1)
Student	29 (30)
Housewife	24 (24)
Farmer	1 (1.0)
Businessman	11 (11)
Service	28(28)
Retired	3 (3)
Others	3 (3)
Monthly family income (in taka)	
<10000	23 (23)
10001-30000	35 (35)
>30000	39 (39)
History of previous dengue infection	3 (3)
Lifestyle	
Sedentary	37 (37)
Active	63 (63)
Smoking history	
Current	19 (19)
Ex-smoker	8 (8)
Non-smoker	73 (73)
BMI (in kg/m2)	

<18.5	1 (1)
18.5-24.9	69 (69)
25-29.9	22 (22)
30-39.9	8 (8)

Table-2: Comorbidities of dengue patients (n=100)

Comorbidities*	
None	65 (65)
DM	26 (26)
HTN	16 (16)
IHD	1 (1)
CKD	2 (2)
Dyslipidaemia	7 (7)
Hypothyroidism	5 (5)

Table-3: Concurrent acute illness of dengue patients (n=100)

Concurrent acute illness	
None	89
AMI	1
Pneumonia	2
UTI	3
Others	5

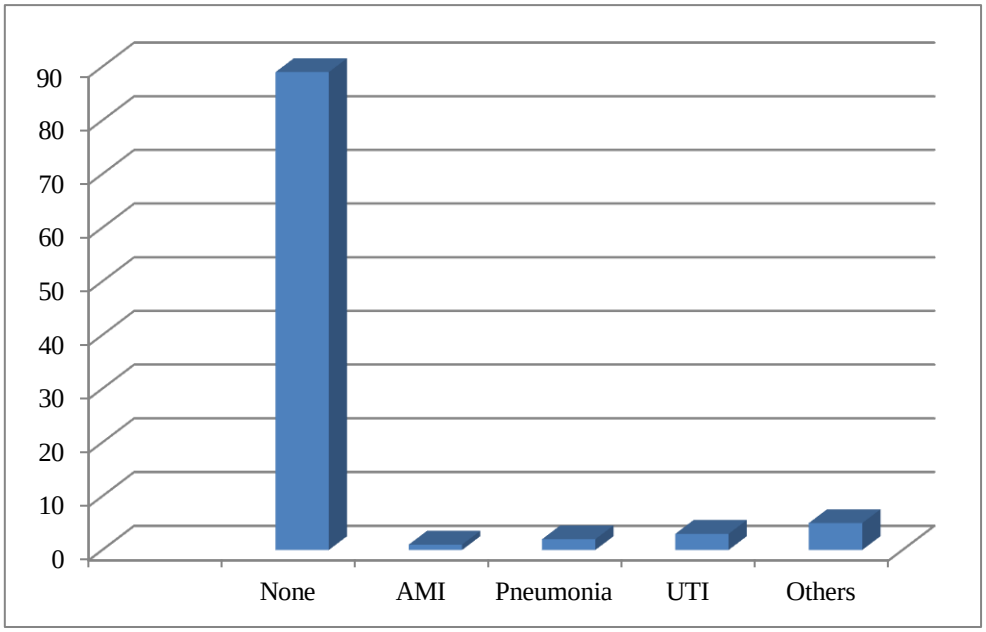

Fig-1: Concurrent acute illness of dengue patients.

Discussion

This study was performed to find out the socio- demographic pattern and clinical parameters of dengue patients of Bangladesh. It was found that majorityof the infected patients were male, urban resident, belonged to the age group of below 40 years. Diabetesmellitus (DM) was the major comorbidities among thepatients followed by hypertension (HTN). Study features of this retrospective analysis may have clinical implications by exploiting them in the management of future dengue outbreak and it will help policy maker in taking decision for better patient care and in raising awareness among general population. Dengue was fairly unfamiliar disease in Bangladesh when first outbreak occurred in 2000. The pronounced morbidity and unacceptable mortality during early yearswere taken care with great rapidity by health care system. The impact of the illness due to dengue on our health care system has made it very familiar in our society. Thedisease is

very much related to our environment, economy and national policy. Each year, thousands of dengue infections are reported and there are several outbreaks of dengue in several countries including Bangladesh and this certifies the global importance of this infection. Fighting with dengue outbreak is important in public health. Normally, patients in dengue outbreak usually present the classical symptoms, acute febrile illness hemorrhagic complication. However, some outbreaks present uncommon clinical presentations might be problematic in diagnoses. Mean age of all patient in our study was over 35 years with male predominance. About two third of our total study population were below 40 years of age and only 9% patients were more than 60 years of age. These findings match the study findings of Prattay KMR et. al [7]. Their study showed that majority of the cases (73%) were found between the ages of 18 and 40. Age groups of 41–60 years and <18 years were presented with 15.24% and 9.52% of cases respectively while the least percentage of cases (1.90%) were exhibited by patients >60 years of age [7]. Patients reported in our study were taken from a tertiary care hospital which is mostly specialized for adult diabetic population. Another explanation may be due to lack of herd immunity from DENV3 and DENV4 amongthese age groups as these two strain are more prevalent in this year where in previous years DENV1 and DENV2were prevalent. In this study, male patients outnumbered the femalewhich matches many of previous studies [7-10]. This typeof sex differences may be due to social background ofthe Asian countries. Males in this region are more likelyto work outdoor rendering more exposed to the mosquitobites during day time either at their workplaces or whiletravelling. Moreover male patients have greater chance to go for health care facilities in Bangladesh. Reportedly, men attend or are taken to the health services more frequently than woman both in rural and urban areas and hence even if there was an equality in the number of incident dengue cases, this could have affected the reported figures. In contrast in some South American studies [11,12] an opposite scenario was observed where the female dengue cases were either equal or higher than that of male. These may be due to their social circumstances where female's outdoor activities outnumber males. Maximum patients of our study were from urban residence. This is due to that our study center is a tertiarycare hospital of a megacity of the country and it is situated at the heart of the city. Thus this study figures out a major regional difference in the frequency of the disease occurrence which will help policy maker to takeaction regarding prevention of dengue outbreak in near future. These findings also match with some recent studies [13,14]. Urban environment acts as better habitat for Aaedes aegypti. However, the fact that our concernedhospital was city-based and that the financial status, awareness and access to the health facilities of city dwellers are superior to that of rural people which may also contribute to this finding. Nearly two third (63%) of our patient lead active lifestyle where only 37% patients were sedentary. These findings may explain the sociodemographic status of our country. As most of our study population were male and our social structure is of male predominant where male family members used to do the maximum outdoor activities rendering more exposed by mosquito bites during day time. Another explanation is that traditional medical practices and home remedies were widely perceived and experienced among our female population which refrain them from seeking institutionalcare for DF. We did not analyze any relationship with socioeconomicconditions with increased risk of dengue. A study doneby Farinelli et al. showed a positive relationship betweenlow socioeconomic condition and increased risk of dengue [15]. They studied the first dengue epidemic in a highly susceptible population at the beginning of the outbreak at Sao Paulo and therefore it may have allowedto identify an association between low socioeconomicconditions and increased risk of dengue. Further study including some public hospital and community clinic may remove this error. Regarding level of education and association of DF, ourstudy showed that nearly half of the study population were graduate, where only 4% were illiterate. This findings may explain that educational level is much higher in cities compared to rural area and another thing is that it is also higher in male due to our socio demographic and religious status. Approximately one quarter of our population were service holder, another quarter were student, housewife and only 1% were unemployed. After extensive literature search we did not find any association with increased risk of DF with any occupation but a study done by Apisarnthanarak et al, found that adults are at increased risk for dengue virus infection include health care workers (HCWs) in hospitals with excess standing- water sources [16]. Though DF presents with complex manifestations but treatment is relatively simple, inexpensive, and very effective in saving lives if correct intervention can implement in timely manner. Early detection of the cases, its classification, treatment, and referral in an organized manner can reducing dengue mortality to a great number. If we can ensure delivery of optimal clinical services atall levels of health care, from primary to tertiary the morbidity and mortality rate

can reduce further. Most dengue patients recover without requiring hospital admission while some may progress to severe disease.

Conclusion

Normally, patients in dengue outbreak usually present the classical symptoms, acute febrile illness hemorrhagic complication. However, some outbreaks present uncommon clinical presentations might be problematic in diagnoses. The severity of infection varies in different outbreak. The mortality in different outbreaks are usually different. The medical facilities and skill of local practitioner important determinants of outcome of dengue case management.

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