Original Research Article

A study to assess pulmonary manifestations among dengue patients

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Abstract

Background: Dengue infection presents classically as dengue fever (DF), dengue hemorrhagic fever (DHF), and dengue shock syndrome (DSS), which can be fatal. Respiratory distress is a challenge in treating dengue shock syndrome (DSS) because it has many contributing factors, including pleural effusion, peritoneal, increased permeability of the lung parenchyma, metabolic acidosis, and cognitive disorders. **Aim of the study:** To assess pulmonary manifestations among dengue patients.**Materials and methods:** The present study was conducted in the Department of General Medicine. A total of 30 patients with confirmed diagnosis of Dengue admitted to the inpatient department were included in the study. Clinical parameters and investigations like complete blood count (CBC), haematocrit, renal profile, liver profile and arterial blood gas analysis (ABG) was collected for the patients. Chest X-ray P.A view and USG thorax were done. **Results:** A total of 30 patients with dengue fever were studied in this study. 18 patients were male and 12 patients were female. The mean age of the patients was 41.39 years. It was observed that dengue hemorrhage fever (n=14) was most common and dengue shock syndrome (n=6) was lease common in study population. The highest mortality rate was seen in dengue shock syndrome and least mortality rate was seen in dengue fever patients. **Conclusion**:Mortality rate of dengue shock syndrome is very high and appropriate treatment modalities must be utilized for treating pulmonary complication for dengue patients.

Keywords: Dengue, respiratory complications, pulmonary complications, dengue shock syndrome.

Introduction

Dengue is the most common arboviral disease of humans and in recent years has become a major global public-health problem. Approximately 2.5 billion people, living mainly in urban areas of tropical and subtropical regions, are estimated to be at risk of acquiring dengue infection[1]. The resurgence of dengue has been observed in India, and dengue outbreaks have been frequently reported from different parts of the country in both urban and rural populations [2,3].

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Dengue infection presents classically as dengue fever (DF), dengue hemorrhagic fever (DHF), and dengue shock syndrome (DSS), which can be fatal. Rare manifestations are becoming more common. Respiratory distress is a challenge in treating dengue shock syndrome (DSS) because it has many contributing factors, including pleural effusion, peritoneal, increased permeability of the lung parenchyma, metabolic acidosis, and cognitive disorders [4]. The treatment vary depending on the cause of the respiratory failure, while the treatments themselves can contribute to extremely serious complications in patients with DHF. Therefore, good control of respiratory distress is essential for the successful treatment of DHF. Respiratory distress in patients with DF commonly arises due to pleural effusion and peritoneal and capillary alveolar lesions

[5,6]. Hence, the present study was conducted to assess pulmonary manifestations among dengue patients.

Materials and methods

The present study was conducted in the Department of General Medicine. The ethical clearance for the study was approved from the ethical committee of the hospital. A total of 30 patients with confirmed diagnosis of Dengue admitted to the inpatient Department were included in the study. Dengue fever was clinically suspected on the basis of presence of febrile illness, headache, low platelet, myalgia, retro-orbital pain, bleeding, haemoptysis, shock, cough, dyspnoea and chest pain. An informed written consent was obtained from the participants after explaining them the protocol of the study. Clinical parameters and investigations like complete blood count (CBC), haematocrit, renal profile, liver profile and arterial blood gas analysis (ABG) was collected for the patients. Chest X-ray P.A view and USG thorax were done. All respiratory manifestations in the patients were also recorded.The statistical analysis of the data was done using SPSS version 11.0 for windows. Chi-square and Student's t-test were used for checking the significance of the data. A p-value of 0.05 and lesser was defined to be statistically significant.

Results

A total of 30 patients with dengue fever were studied in this study. 18 patients were male and 12 patients were female. The mean age of the patients was 41.39 years. [Fig 1] Table 2 shows the pulmonary manifestations of dengue cases. It was observed that dengue hemorrhage fever (n=14) was most common and dengue shock syndrome (n=6) was lease common in study population. The highest mortality rate was seen in dengue shock syndrome and least mortality rate was seen in dengue fever patients. The results on comparison were found to be statistically significant. [Fig 2]

Discussion

In the present study, we studied 30 dengue patients to assess the pulmonary manifestations of dengue. In our study, 18 were male patients and 12 were female patients. The mean age was 41.39 years. Kumar A et al [7] studied the clinical manifestations, trend and outcome of all confirmed dengue cases admitted in a tertiary care hospital. Study included 466 patients. Similar to our study, the number of male patients was more in the study (64.6%). They report that the most common hemorrhagic manifestation was petechiae 84 (67.2%). 391 (83.9%) cases presented with dengue fever, 41 (8.8%) dengue hemorrhagic fever, and 34 (7.3%) with dengue shock syndrome. Out of 66 (14.1%) patients who developed clinical complications, 22 (33.3%) had ARDS and 20 (30.3%) had pleural effusion. Deaths reported were 11(2.4%). Rodrigues RS et al[8] evaluated lung changes associated with dengue infection, they retrospectively analyzed 2,020 confirmed cases of dengue. Twenty-nine of these patients (11 females and 18 males aged 16–90 years) underwent chest computed tomography (CT), which yielded abnormal findings in 17 patients: 16 patients had pleural effusion (the sole finding in six patients) and 11 patients had pulmonary abnormalities. Lung parenchyma involvement ranged from subtle to moderate unilateral and bilateral abnormalities. The most common finding was ground-glass opacity in eight patients, followed by consolidation in six patients. Less common findings were airspace nodules (two patients), interlobular septal thickening (two patients), and peri bronchovascular interstitial thickening (one patient). Lung histopathological findings in four fatal cases showed thickening of the alveolar septa, hemorrhage, and interstitial edema. They conclude that pleural effusion was the most frequent finding and lung involvement was often mild or moderate and bilateral. Extensive lung abnormalities are infrequent even in severe disease and when present should lead physicians to consider other diagnostic possibilities. In the present study, dengue hemorrhage fever (n=14) was most common and dengue shock syndrome (n=6) was lease common in study population. The highest mortality rate was seen in dengue shock syndrome and least mortality rate was seen in dengue fever patients. Nagat Ali Mohamed et al [9] evaluated the incidence of pulmonary manifestations among dengue hospitalized cases in the International-Yemen Hospital-Taiz which is an endemic area. The study was conducted in 100 patients seropositive of dengue confirmed by real time-PCR (RT-PCR). Respiratory manifestations were recorded and all clinical examination findings were recovered. They reported that young age patients and patients with co-morbidity are risky to severe form of dengue fever and have a high risk of death. As regards co-morbidities, chronic chest disease and cardiac disease are mostly vulnerable to DHF and DSS. Nguyen Phung et al [10] investigated DHF treatment in a provincial pediatric hospital in southern of Vietnam. All DSS cases treated at DPH in the study period were invited to participate in the study. In total, 1,085 pediatric patients were admitted to DPH, and 800 of them

developed dengue shock syndrome (DSS); the mortality rate was 0.3%. The average age of DSS patients was 9.3 ± 3 years. A total of 137 patients (17.1%) suffered from respiratory distress. The onset of respiratory distress was 23.6 hours after resuscitation with fluid, and 76.3% of these patients received respiratory support with nasal continuous positive airway pressure (CPAP). Mechanical ventilation was required in 5.9% of patients; the shortest time of mechanical ventilation was 1.5 days and the maximum were 13 days. The epidemiology, signs, and treatment of respiratory distress are associated with many factors, including age, mucosal hemorrhage, hematocrit (Hct), albumin, blood lactate at shock, total fluid volume, molecule fluid volume, number of hours of infusion, amount of urine during infusion, and rate of re-shock.

Table 1: Demographic data of patients

Variables	Number of patients
Total no. of patients	30
No. of male patients	18
No. of female patients	12
Mean age (years)	41.39

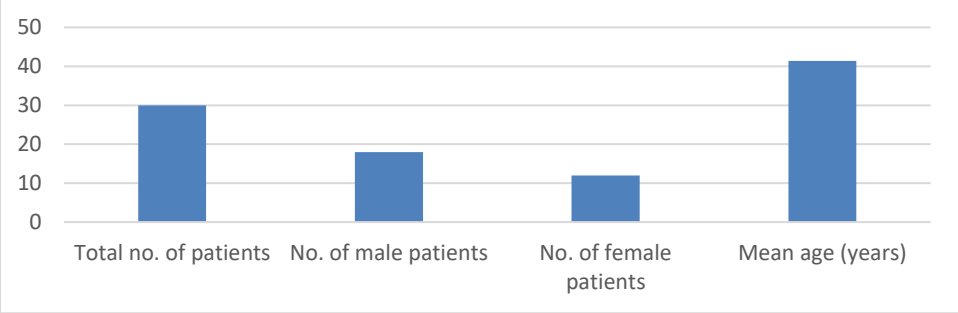

Fig 1: Demographic data

Table 2: Pulmonary manifestations of dengue cases

Clinical presentation	Cured cases	Dead cases	Total
Dengue fever	8	2	10
Dengue hemorrhage fever	5	9	14
Dengue shock syndrome	1	5	6

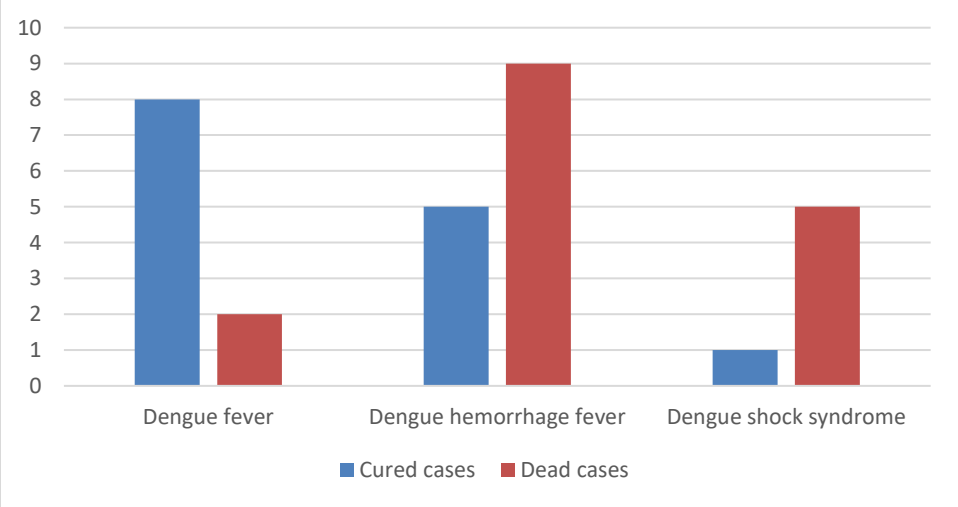

Fig 2: Pulmonary manifestations of dengue cases

Conclusion

Within the limitations of the present study, it can be concluded that mortality rate of dengue shock syndrome is very high and appropriate treatment modalities must be utilized for treating pulmonary complication for dengue patients.

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