

REVIEW

Lung Disease in Dengue

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ABSTRACT

Dengue is an important tropical arboviral infection. The lung disease in dengue is limited mentioned. In this short, editorial, lung disease in dengue is summarized, detailed and discussed.

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Key words: Lung; Disease; Dengue

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INTRODUCTION

Dengue is an important tropical arboviral infection. It is classified as an important mosquito borne disease. Dengue usually presents as an acute febrile illness with thrombocytopenia and hemorrhagic complication. The classical triad, thrombocytopenia, atypical lymphocytosis and hemoconcentration is the laboratory hallmark of dengue infection^[1]. This infection is very common in tropical countries especially for Southeast Asian countries. Thousands of patients visit to the hospital and are hospitalized annually.

Not only classical clinical features of dengue but also atypical presentation can be the clinical presentation^[2]. It is no doubt that the respiratory presentation of dengue can be seen in clinical practice. Nevertheless, the lung disease in dengue is limited mentioned. In this short, editorial, lung disease in dengue is briefly summarized, detailed and discussed as a source for the readers to further use a short note.

PREVALENCE OF LUNG DISEASE IN DENGUE

As already noted, lung disease can be seen in dengue but there are only a few reports on it. The interesting question is “what is the prevalence of lung disease in dengue?” As far as known, there is no official report on the lung disease among general patients with dengue. However, there are some reports on the prevalence among dengue death cases or severe dengue cases. Wiwanitkit recently studied magnitude of pulmonary pathology in fatal cases of dengue hemorrhagic fever in Thailand and found that almost all death cases had lung pathology^[3]. A similar observation was also reported from Cuba^[4]. Guzmán et al. noted that lung pathology could be seen in all fatal dengue cases in their study and the virus could be identified in lung of the death cases^[4]. Another report from Venezuela also showed the same finding that all dengue death cases had lung disease^[5]. Arismendi-Morillo et al. mentioned that “all these cases showed severe lung disease (diffuse alveolar damage, non cardiogenic pulmonary edema, thromboembolism, bronchopneumonia, pneumonitis, intralveolar hemorrhage^[5].” Arismendi-Morillo et al. also reported that respiratory failure was the cause of death in two-thirds of the studied fatal cases^[5]. Focusing on non fatal cases, a recent report from Yunnan among severe dengue patients also showed a similar finding^[6]. About 38.6 % of severe dengue cases in this report presented pleural effusion due to plasma leakage^[6].

POSSIBLE PATHOPHYSIOLOGY OF LUNG DISEASE IN DENGUE

The pathophysiology of lung disease in dengue is still not conclusive. There are many possible causes of lung disorders among dengue patients. First, thrombocytopenia can directly cause spontaneous bleeding in any organs including to lung in dengue patients^[1].

Sharma et al. noted that pulmonary haemorrhage among dengue patients was rare and could present with haemoptysis requiring blood transfusion^[7]. Second, the plasma leakage during dengue infection can also be the causes of lung problem in dengue^[1,6]. This process is approved to be a consequence of dengue immunopathology^[8]. Third, the superimposed lung infections in dengue patients are also reported^[1]. Those pathophysiological processes can be the causes of lung disease in dengue.

SOME IMPORTANT LUNG DISEASES IN DENGUE

1. Pulmonary hemorrhage

Pulmonary hemorrhage is a severe lung disease in dengue. It is not common but serious. This can be early detected by lung CT scan^[9-10]. The pattern is usually diffuse alveolar hemorrhage. In immunocompetent host, dengue must be a differential diagnosis in any cases with problem of diffuse alveolar hemorrhage^[11-12]. The other differential diagnoses are influenza A (H1N1), leptospirosis, malaria, and *Staphylococcus aureus* infection^[11]. Nevertheless, it should be noted that the combination of dengue and other concurrent tropical infection is also possible to cause pulmonary hemorrhage (such as concurrent dengue and leptospirosis induced pulmonary hemorrhage^[13]). The case can be serious and fatal. The management is usually supportive and symptomatic.

2. Pleural effusion

As noted pleural effusion is a sign of severe dengue. Neeraja et al. noted that this problem was accounted for 11 % of severe dengue patients^[14]. Namvongsa et al. noted that pleural effusion was the sign of dengue hemorrhagic fever and dengue shock^[15]. According to the report by Michels et al^[16] and Zaki^[17], it was noted that the ultrasonography could help early diagnose effusion and could help the physician in charge to plan for management of pending severe clinical features of dengue. To manage the patients, conservative management can be useful in cases with small effusion. However, in cases with large amount of effusion, the intercostal drainage placement is indicated^[18]. In some severe case, a more complex complication, hemothorax can be observed^[19] and the use of intercostal drainage placement is useful for management. The fluid replacement therapy and balancing of body fluid is required, which can be based on standard guideline for management of any dengue cases^[1].

3. Pneumonia

In general dengue does not cause pneumonia. Finding of pneumonia in dengue case is possible and usually implies superimposed bacterial infection. *Staphylococcus aureus*^[20-21] and melioidosis^[22] are the two common problematic pneumonias that can superimpose dengue infection. To manage the problem, identification of the pathogen and assignment of proper antibiotic is required.

4. Pulmonary edema

Pulmonary edema can also be the problem in dengue. The pathophysiology is the same as the case of pleural effusion. Disturbance of colloid oncotic pressure is believed to be the main cause of the problem^[23]. Sometimes, the problem can also be seen in concordant with other dengue systemic problem such as dengue myocarditis^[24]. It should also be noted that pulmonary edema can be sometimes iatrogenic. The case of pulmonary edema after platelet

transfusion^[25] or excessive fluid therapy^[26] in dengue patient is the good example. The acute pulmonary edema in those cases are usually observed in the convalescence phase^[26].

5. Respiratory distress syndrome

Respiratory distress syndrome is the most serious lung disease in dengue and this can result in respiratory failure^[27]. Sometimes, the problem can also be seen in concordant with other dengue systemic problem such as acute pancreatitis^[28] and myocarditis^[29]. Ranjit et al. noted that aggressive management was needed and could be helpful in increasing survival^[30]. The fluid replacement therapy, balancing of body fluid as well as ventilation management is required^[30].

Concurrent lung problem in patients with dengue.

As already noted, there is a possibility that there might be concurrent infection with dengue. The concurrent lung problem in patients with dengue is possible. The good example is the concurrent tuberculosis and dengue^[31]. Indeed, this combination can be easily expected (since both infections are usually endemic in the same tropical areas) but underdiagnosed. Other rarer lung diseases can also be seen. Pulmonary aspergillosis is the good example^[32]. This should be carefully thought of by general practitioner.

CONCLUSION

Lung disease is not common among general dengue patients, however, it is common among severe dengue cases or fatal cases. The problem can be various manifested and can lead to death. The practitioner has to recognize on the lung disease among the patient with dengue and proper manage it.

CONFLICT OF INTERESTS

The author has no conflicts of interest to declare.

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