

## ARDS in dengue infection-A case series

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### 1. Introduction

Dengue is one of the most important emerging tropical viral diseases of humans in the world today. Global incidence of dengue has grown dramatically in recent decades. The World Health Organization [WHO] estimates that there are 50 to 100 million infections yearly, including 50,000 Dengue Hemorrhagic Fever [DHF] and 22,000 deaths, mostly among children (WHO, 1997). Pulmonary manifestations are rarely seen in DHF. Pleural effusion and pneumonitis have been described as rare complication of DHF.

Of late, there are reports of Adult Respiratory Distress Syndrome [ARDS] with Dengue Fever (Sen *et al.*, 1999; Wang Lin *et al.*, 2007; Devarajan *et al.*, 2008). There are very few studies showing this complication of dengue infection. This could result in a lack of widespread awareness of ARF (Acute Respiratory Failure) due to ARDS in dengue patients. Consequently, clinicians are likely not aware of the potential for ARF when treating dengue patients at high risk for the same. This study provides relatively rare data regarding a series of dengue patients with ARF.

Following is the case series of patients who had been admitted to the AVBRH hospital & where diagnosed as dengue infection & were latter developed ARDS.

- Criteria for diagnosis of ARDS were: (Harrison's,)
- PaO<sub>2</sub>/FiO<sub>2</sub> ≤ 200mmHg
- 2)B/L Alveolar or Interstitial infiltrates.
- PCWP ≤ 18mmHg or no clinical evidence of increased left atrial pressure.

### 2. Discussion

Dengue fever is a viral hemorrhagic fever caused by four flavivirus serotypes [DEN-1, DEN-2, Den-3 and Den-4]. Out of these the type 2 is the most serious one. There is no cross protection in these strains. Also superinfection in the form of one strain infecting first which is followed by infection of another strain which leads rapidly to dengue haemorrhagic fever of which second strain is usually the culprit.

Dengue infection is transmitted mainly by *Aedes aegypti* mosquito. ARDS is a syndrome of inflammation and increased permeability associated with a constellation of clinical, radiologic, and physiologic abnormalities unexplained by elevations in left atrial or pulmonary capillary pressure. Most dengue infections are asymptomatic. Symptomatic dengue virus infection can present with a wide range of clinical manifestations, from a mild febrile illness to life-threatening shock syndrome. Dengue is often classified into two nosologic entities: dengue fever (DF) and dengue hemorrhagic fever (DHF). Dengue hemorrhagic fever is the most serious manifestation of dengue virus infection.

However, it has been seen that dengue infection these days is presenting in many unusual ways like cholecystitis, ARDS etc., it is very important to recognise the fatal complication of ARDS in these patients because it has been seen that in very short time florid ARDS is being developed. According to the study of Wang *et al* prognosis depends on age, dyspnea, cough, Prothrombin time, activated partial thromboplastin time, aspartate aminotransferase, alanine aminotransferase, blood urea nitrogen, creatinine, albumin, renal insufficiency, acute renal failure, acute hepatic failure, UGI bleeding, and combination bacterial infection were significantly predictive variables associated with dengue patients with ARDS (Wang Lin *et al.*, 2007).

During dengue virus infection, dengue virus (or viral antigen) has been detected in pulmonary macrophages and pulmonary endothelial cells. In fatal cases of dengue, histopathologic findings include interstitial inflammation and haemorrhage, alveolar fluid and protein (including fibrin), and lung haemorrhage. Hypoxemia with a widened alveolar-arterial oxygen gradient is common in patients with severe dengue. Nevertheless, the effects of dengue virus infection on the lung are not completely understood and poorly appreciated.

Wang *et al* reported from their study that sepsis and upper gastrointestinal bleeding are the main cause for these patients to progress into ARDS (Wang Lin *et al.*, 2007). In our case series 5 out of 7 cases had overwhelming sepsis as is supported by the Wang *et al*

Study. However none had any episode of upper GI bleed or derangement of coagulation profile.

Case series							
S.No.	Age /Sex	Absolute Platelet Count	Sepsis	Dengue Serology	PaO <sub>2</sub> /FIO <sub>2</sub> Ratio	Time from development of Fever to ARDS(days)	Outcome After Management Of ARDS
1	15/F	58,000cells/mm <sup>3</sup>	+ve	IgG -ve IgM +ve	156	5	Survived
2	52/M	72,000cells/mm <sup>3</sup>	+ve	IgG -ve IgM +ve	180	10	Survived
3	25/M	90000 cells/mm <sup>3</sup>	-ve	IgG -ve IgM +ve	165	6	Survived
4	22/F	40000 cells/mm <sup>3</sup>	+ve	IgG +ve IgM +ve	160	4	Death on 14th day
5	50/M	89000 cells/mm <sup>3</sup>	-ve	IgG -ve IgM +ve	150	3	Death on 15th day
6	19/F	80,000cells/mm <sup>3</sup>	+ve	IgG -ve IgM +ve	182	4	Survived
7	40/F	46,000cells/mm <sup>3</sup>	+ve	IgG +ve IgM +ve	173	4	Death on 10th day

X-rays of the above patients:



Fig.1. F/15 YRS



Fig.2. M/52



Fig.3. M/25



Fig.4. F/22 YRS



Fig.5. M/50YRS



Fig.6 F/19



Fig.7. F/40 YRS

#### All the X-ray showing B/L alveolar or interstitial infiltrates s/o ARDS

Also all the patients had low platelet count thus indicating that thrombocytopenia may also contribute as poor prognostic indicator of ARDS in many cases. Management of ARDS in Dengue is similar to ARDS of any other etiology. Initial therapy is focused on maintaining adequate oxygenation and tissue perfusion through mechanical ventilation and fluid management (Devarajan *et al.*, 2008). Minimizing nosocomial complications, preventing MODS, and attenuating the inflammatory response also play prominent roles in ARDS management.

To conclude ARDS to be kept in mind while treating cases of dengue fever. It should be anticipated early and aggressively man-

aged for better outcome.

### 1. References

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