

DENGUE INFECTION IN ELDERLY PATIENTS

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Abstract. From 2005 to 2013, there were 15 dengue patients aged over 60 years old who were admitted to Photharam Hospital, Ratchaburi, Thailand. Ten were females and five were males. Nine had dengue fever (DF), and 6 had dengue hemorrhagic fever (DHF). A trending shift in age group towards adults has been seen during the past decades. No deaths were seen in these elderly patients with dengue disease, indicating early recognition and effective management of these dengue patients. The trend towards higher age in dengue patients is a problem of concern, which needs further elaboration.

Keywords: dengue, elderly, Photharam Hospital, Thailand

INTRODUCTION

Dengue infection is one of the major public health problems in Asia and Latin America. The etiological agents include four dengue serotypes, and the principal vector is the *Aedes aegypti* mosquito (Thisyakorn and Thisyakorn, 2014). In past decades, a trend of increasing age in dengue towards adulthood has been evident in Asia (Tanayapong *et al*, 2013). Moreover, clinical manifestations and severity of dengue infection varied with age (Panpitpat *et al*, 2007). With co-morbidities, elderly dengue patients have a higher risk of severe dengue and mortality (Tantawichien, 2012).

In Thailand, a dengue patient was first seen in Bangkok in 1958, after which further cases appeared in other parts of the country (Thisyakorn, 2014). Dengue

epidemics are known to have occurred regularly during the past decades in Photharam District, Ratchaburi Province, Thailand causing a heavy burden on the healthcare system. Despite dengue control programs, case management guidelines, and surveillance efforts, dengue virus transmission rates remain high, and prevention remains a public health priority (Capeding *et al*, 2013).

Complex disease presentation and sudden development of hemorrhagic symptoms in seemingly stable patients can cause a fatal outcome even in well-prepared hospitals. There are currently neither an approved preventive vaccine nor a specific anti-viral treatment against dengue. Main public health preventive interventions consist of mosquito control, which is currently used in endemic countries, and the use of vector repellents. Both these measures have produced generally only limited results. The development of a dengue vaccine is regarded as the best hope to fight this disease (Thisyakorn *et al*, 2014).

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Table 1
The clinical manifestations in 15 elderly patients with dengue diseases.

Clinical manifestations	Patients <i>n</i> , (%)
Fever	15 (100)
Headache	5 (33)
Upper respiratory symptoms	5 (33)
Nausea	4 (27)
Abdominal pain	4 (27)
Vomiting	2 (13)
Petechiae	2 (13)
Diarrhea	1 (7)
Alteration of consciousness	1 (7)
Confluent petechial rash (during convalescence)	1 (7)

MATERIALS AND METHODS

Analysis of the data of the elderly dengue patients admitted to Photharam Hospital, a provincial hospital in Ratchaburi Province, Thailand from January 2005 to December 2013 was done after the approval of an ethics review committee. Photharam Hospital is among the ten clinical trial sites of a potential dengue vaccine (Capeding *et al*, 2014). The hospital is in Ratchaburi Province, which is approximately 100 kilometers west of Bangkok. The diagnosis of dengue patients adhered to clinical and laboratory criteria for the diagnosis of dengue patients as established by the World Health Organization (WHO, 1997).

RESULTS

From 2005 to 2013, there were 15 dengue patients, aged over 60 years old, who were admitted to Photharam Hospital, Ratchaburi, Thailand. Ten were female and 5 were male. The age range was between 60-to-87 years old, with a mean age of 68.7 years and a median age of 66 years.

The clinical characteristics of the 15 elderly patients with dengue disease are summarized in Table 1. All patients had fever with an average of 3 days in duration and with a range of 1-5 days prior to admission. The symptoms and signs included headache (33%), upper respiratory symptoms (33%), nausea (27%), abdominal pain (27%), vomiting (13%), petechial hemorrhage (13%), diarrhea (7%), alteration of consciousness (7%), and confluent petechial rash occurring at both legs during the convalescent stage of the disease (7%).

According to 1997 WHO case classification of dengue, 9 patients had dengue fever (DF), and 6 had dengue hemorrhagic fever (DHF).

The mean maximal hematocrit value was 38.9% with a range of 32%-45%. The mean minimal value of white blood cell count was 3,061 cells/mm³ with a range of 1,540-5,940 cells/mm³. The mean minimal value of platelet count was 72,467/mm³ with a range of 8,000-158,000/mm³.

Increased liver enzymes (alanine aminotransferase, ALT and aspartate ami-

nottransferase, AST) were found, and AST was higher than ALT.

All patients recovered uneventfully. There was no mortality.

DISCUSSION

During the past decades, dengue epidemics are known to have occurred regularly in Ratchaburi Province, Thailand causing a heavy burden on the healthcare system. Population growth together with a remarkable degree of urbanization has allowed dramatic expansion of the mosquito numbers through an increase in urban breeding sites, which explains the explosive increase of reported cases of dengue infection. A greater awareness and high reporting behavior could have contributed to some of the increase over time. A trend of increasing age in dengue towards adulthood has been evident in Asia including the area of Ratchaburi Province, Thailand (Tanayapong *et al*, 2013).

This study showed that the full range of severity of dengue manifestations could happen in elderly patients. DF is usually self-limiting, and death is uncommon. However, age-related differences in dengue severity are poorly understood, and data on clinical features in elderly patients are limited. Older age has previously been reported to be a risk factor for mortality in patients with DF or DHF because the co-morbidities associated with ageing and waning immunity pose a substantial risk for fatality in elderly patients with active infection. Although shock and plasma leakage seem to be more prevalent in younger patients, the frequency of internal hemorrhage increases with age. Furthermore, complications of dengue infection observed

in adults, including DF with unusual bleeding and DHF, have been increasing (Tantawichien, 2012).

Increased liver enzymes as seen in our patients have been found in children and adults during dengue infection, indicating liver involvement. Unlike conventional viral hepatitis, AST level is higher than ALT in dengue infection as seen in our patients. Pre-existing liver disease such as chronic hepatitis is more likely to be present in adults than in children with dengue and may exacerbate the liver impairment. Liver injury is often self-limiting, but fulminant hepatitis and death have been reported. Alteration of consciousness in dengue patient as seen in one of our patients has been described as dengue encephalopathy. Possible causes of dengue encephalopathy include hypotension, cerebral edema, focal hemorrhage, hyponatremia, and fulminant hepatic failure (Tantawichien, 2012). However, a documented possibility is dengue invasion of the central nervous system. (Thisyakorn and Thisyakorn, 1994).

All patients had an uneventful recovery due to early diagnosis, careful monitoring, and effective management. Evidence-based data on the management of dengue specific for elderly patients are scant but are needed because the disease poses a substantial risk for fatality. The following are special considerations in adults with dengue (Royal College Physician of Thailand, 2014):

- Adults have higher co-morbidities and underlying diseases.

- More than 90% of adult dengue patients have elevated liver enzymes. Therefore, administration of hepatotoxic medications should be avoided.

- If jaundice presents, other diseases should be suspected.

- Dual infections should be suspected in a patient with atypical presentation.

- Internal hemorrhage should be suspected in a patient with a rapidly decreasing hematocrit.

Prevention of dengue depends on the control of the mosquito vector by limiting its breeding places and treatment of stored water with larvicide. These measures against dengue are effective only with a high level of government commitment, education, and community participation (Thisyakorn, 2014). Ultimately, an effective and long lasting vaccine needs to be utilized. Due to the unique challenges of dengue, including the need to provide protection against the four antigenically-distinct serotypes of the viruses (Thisyakorn *et al*, 2014); no vaccine is yet licensed to protect against this disease.

REFERENCES

- Capeding MR, Tran NH, Hadinegoro SRS, *et al*. Clinical efficacy and safety of a novel tetravalent dengue vaccine in healthy children aged 2 to 14 years in Asia: a phase III randomized observer-masked, placebo-controlled trial. *Lancet* 2014 Jul 10. [Epub ahead of print].
- Capeding MA, Chua MN, Hadinegoro SR, *et al*. Dengue and other common cause of acute febrile illness in Asia: an active surveillance study in children. *PLoS Negl Trop Dis* 2013; 7: e2331.
- Panpitpat C, Panpitpat A, Hemungkorn M, Thisyakorn U. Dengue patients in different age Groups. *Asian-Oceanian J Pediatr Child Health* 2007; 6: 1-7.
- Royal College Physician of Thailand. Practical guideline for management of dengue in adults 2014. *Pediatr Infect Dis Soc Thai Gaz* 2013; 19: 20-9.
- Tanayapong S, Pengsaa K, Thisyakorn U. Changing epidemiology of dengue patients in Ratchaburi, Thailand. *Asian Biomed* 2013; 7: 561-6.
- Tantawichien T. Dengue fever and dengue haemorrhagic fever in adolescents and adults. *Paediatr Int Child Health* 2012; 32 (suppl 1): 22-7.
- Thisyakorn U. Dengue: Global health threat. *Southeast Asian J Trop Med Public Health* 2014; 45 (suppl 1): 107-12.
- Thisyakorn U, Capeding RM, Hadinegoro SR. The first tetravalent dengue vaccine is poised to combat dengue. *WHO Dengue Bull* 2014 (in print).
- Thisyakorn U, Thisyakorn C. Dengue infection with unusual manifestations. *J Med Assoc Thai* 1994; 77:410-3.
- Thisyakorn U, Thisyakorn C. Dengue: a global health threat. *J Med Assoc Thai* 2014 (in print).
- World Health Organization (WHO). Dengue haemorrhagic fever: diagnosis, treatment and control. 2nd ed. Geneva: WHO, 1997.