

Post-earthquake and Tsunami Tetanus Outbreak—A Case Series of 34 Patients from Banda Aceh

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Introduction: This presentation describes 34 case studies of patients who developed tetanus after the devastating earthquake and tsunami that hit Northern Sumatra on 26 December 2004. It is the largest single reported cluster of cases. The World Health Organization reported 107 cases of tetanus post-tsunami.

Methods: Most of the authors were part of a volunteer medical team from Singapore and the last author is a surgeon from the affected hospital. Together, they worked in Zainal Abidin General Hospital for six weeks. The hospital had been devastated by the calamity and the team worked towards restoring in-patient services. The first ward in the hospital was re-opened on 10 January 2005.

The case definition of tetanus is clinical. Facilities at hand were limited severely with no intensive care or ventilatory support for the majority of patients. The ANZAC and German field hospital provided surgical support. Water, electricity, oxygen, drugs, and sanitation were lacking.

Data were collected by means of a questionnaire administered upon admission. Daily updates on care and outcomes were recorded. Epidemiological data was reported to the WHO to stem a possible epidemic. Retrospectively, all patient charts were analyzed. The Ablett scale was used to grade the severity of the illness.

Results: During the study period when the team worked in the hospital, there were 34 cases of tetanus. Of these, five patients died, six patients remain in the hospital, but are ambulant, and off all sedation, and 23 patients were discharged after clinical care. The case fatality rate is 15%.

A total of 25 (76%) of the patients were male; all are adults.

Only nine (26%) had deep or complex wounds, 22 had superficial wounds, two had no wounds, and two were not assessed. All wounds occurred on the day of the tsunami. Additionally, 20 of the patients had aspiration (near drowning) pneumonia.

The incubation period was >14 days in 29 (85%) of the patients. The clinical features included: (1) trismus: 97%; (2) abdominal rigidity: 74%; (3) generalized spasms: 71%; (4) dysphagia: 53%; (5) dyspnea: 47%; (6) risus sardonicus and opisthotonos: 41%; and (7) sympathetic overactivity: 47%. According to the Ablett scale, 45% of the patients were categorized as severe.

Management was hampered by drug and resources shortages. All but one patient received intravenous diazepam. A total of 24 patients also had intravenous combination and ketamine sedation. Four patients had tracheotomies and two required ventilatory support.

Conclusion: Treating patients with tetanus often is described as requiring intensive care, ventilation, and paralysis. In this presentation, it was found that: (1) intensive

care unit and ventilation can be avoided with prudent clinical care and the use of ketamine for sedation and spasm control; (2) good nursing care and infection control measures are cost-effective and can save countless lives; and (3) vaccination programs are required pre- and post-event.

Keywords: Banda Aceh; consequences; diazepam; ketamine; management; Singapore; tetanus; tsunami

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Indian Ocean Tsunami: What Have We Learned So Far? What Do We Need to Know—Application of the Utstein Guidelines and Templates

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We have listened to the presentations of the interventions provided following the earthquake and tsunamis in the Indian Ocean of 26 December 2004. The questions are: (1) What have we learned that will enhance our ability to cope with such events in the future?; and (2) If asked to report on what you have heard, how would you structure your report?

You should be able to answer the following questions:

1. What hazard was responsible for the disaster?
2. What was the precipitating event? What was its scope (amplitude, duration, intensity, scale, and magnitude)?
3. Was there a secondary event? If so, what was its scope (amplitude, duration, intensity, scale, and magnitude)?
4. What do we know about the pre-event health status of the affected populations?
5. What physical damage was created? What functional damage resulted? What health damage was created? What other Basic Societal Functions became impaired, and how did their functional deficits affect the medical and public health functions?
6. Is it possible to partition the event into multiple sub-events with different scopes and different types/levels of damage or were all areas affected the same?
7. How was Coordination and Control provided for the responses? What was the authority to do so?
8. Were adequate needs assessments conducted? By whom?
9. Were the responses (interventions) described today directed at specific, well-defined needs?
10. Were the interventions described:
 - a. Effective in meeting predefined objectives and accomplishing stated goals?
 - b. Efficient in using minimal resources to accomplish the goals?
 - c. Cost:effective?
 - d. Produce benefits (value) to the target population?
11. Was the pre-event health status restored? How did the intervention contribute to recovery/rehabilitation?