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Case Report

Tetanus in the elderly: the neglected killer

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Introduction

Tetanus is a life-threatening disease characterized by progressive muscle rigidity and spastic paralysis. *Clostridium tetani* is an obligate anaerobic, Gram-positive, spore-forming bacillus found globally in soil and the intestinal tracts and faeces of different animals. Tetanus toxin or tetanospasmin is the most important virulence factor of *C. tetani* that affects motor neurons causing tetanic convulsions [1].

Tetanus may occur as the result of a serious injury, such as puncture, laceration, or scratching. In some cases, no damage can be detected and chronic conditions such as skin lesions, abscesses, and gangrene may be involved [2].

According to the Centers for Disease Control and Prevention (CDC), between 35 and 70 new cases of tetanus are reported annually in the USA, most of which are related to the elderly population (over 60 years) suggesting a reduction in the protective effect of primary vaccination [3].

Here, we report a case of a 78-year-old, elderly male who presented to National Hospital, Kandy (NHK), Sri Lanka with a history of progressive swallowing difficulty and trismus following a puncture wound in the foot and later was diagnosed to have generalized tetanus. Although there are many case reports regarding tetanus in elderly, globally, data is lacking in the Sri Lankan setup. We believe that this case report might highlight the importance of active immunization against tetanus in the elderly population to prevent related morbidity and mortality.

Case presentation

A 78-year-old, previously well farmer presented to NHK, Sri Lanka with a history of acute onset intermittent type fever for 3 days followed by episodic trismus and swallowing difficulty for 2 days. This was preceded by a history of a prick wound in the left foot while

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working in the paddy fields 5 days previously. The patient was unaware about any previous tetanus vaccination. On examination, the patient was conscious and rational, afebrile, had significant neck and limb spasticity with a fluctuating blood pressure (BP) and pulse rate (PR) during episodes of worsening spasms (BP 208/117 mmHg, PR 126 bpm, baseline 130/80 mmHg PR 80 bpm). Neurological examination revealed spastic limbs and a stiff neck with severe trismus (Figure 1). There was an infected puncture wound on the sole of the left foot (Figure 2.). Other systems including throat examination were normal.

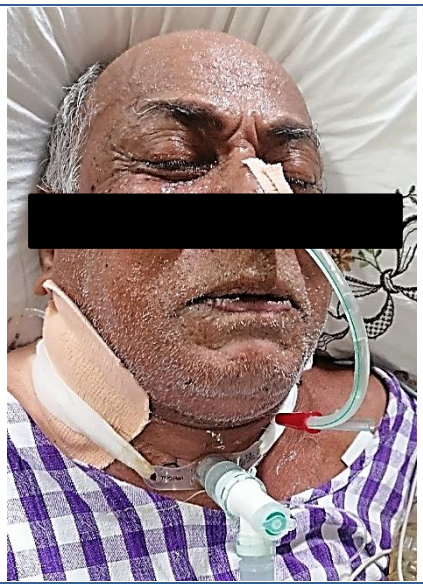

Figure 1: showing trismus

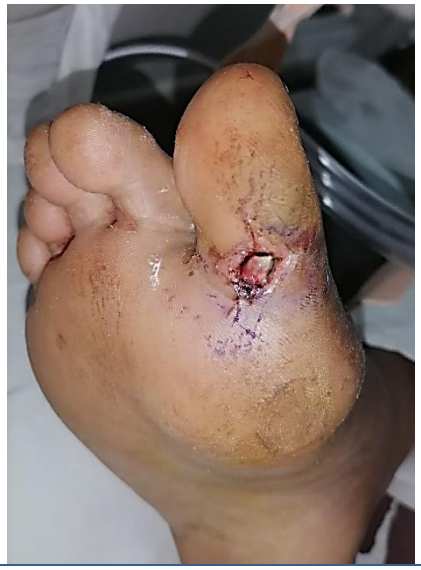

Figure 2: puncture wound on sole of left foot

Emergency endotracheal intubation was considered to prevent acute upper airway obstruction. However, orotracheal intubation failed due to spastic jaw muscles. Hence, a tracheostomy was performed.

His basic investigations revealed a normal full blood count with white blood cells of 9.43 $x10^3$ /µL, haemoglobin of 14g/dL and platelets of 196 x 10^3/µL. C-reactive protein was 25 mg/L and the erythrocyte sedimentation rate was 21 mm in the 1st hour. Patient had acute kidney injury with a serum creatinine of 152µmol/L and blood urea of 18mmol/L. There was mild liver transaminitis with an aspartate aminotransferase of 168IU/L and an alanine transaminase of 88IU/L/. His non contrast-CT brain was normal. Fiberoptic laryngoscopy was normal and did not reveal any luminal obstruction of the upper airways. Contrast enhanced-CT of the neck did not show any pharyngeal or tracheal obstruction and there were no features of Ludwig angina. Electroencephalogram (EEG) did not reveal any epileptiform activity. A clinical diagnosis of generalized tetanus was made according to the clinical and investigation findings.

The patient was managed at the intensive care unit with sedation Human tetanus immunoglobulin 1000 IU and tetanus toxoid 0.5 ml IM was given. IV $MgSO_4$ infusion was started to manage the muscle spasms. Foot wound debridement was done and intra

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venous antibiotics (piperacillin tazobactam 4.5g/8 hourly and metronidazole 500mg 8 hourly) were started.

The patient's ICU stay was complicated by ventilator associated pneumonia and acute kidney injury. He expired on day 46 of ICU stay, following sepsis complicated by multiorgan failure.

Discussion

Tetanus causes more than 50 000 deaths each year according to WHO statistics [4]. Mortality associated with tetanus varies greatly among countries or continents with 80% of deaths occurring in Africa and South East Asia [5].

There are many cases of tetanus reported in the elderly, worldwide [6,7,8]. However, in Sri Lanka, case reports of tetanus are lacking, due to the low incidence of tetanus as a result of the successful immunization programme and other preventive measures. We hope this case report will highlight the importance of ruling out tetanus as a differential diagnosis in a patient presenting with dysphagia, trismus and muscle spasms.

There is no laboratory finding characteristic of tetanus. The diagnosis is entirely clinical and does not depend on bacteriologic confirmation [9].

Supportive care is the mainstay of management. To halt further tetanus toxin production, repeated wound debridement and a course of antibiotics, preferably with intravenous metronidazole 500 mg eight hourly for 7 to 10 days, should be started. Passive immunization with human tetanus immunoglobulin (HTIG) or IV immunoglobulin is used to neutralize unbound toxins. Active immunization with tetanus toxoid is given along with the above treatment to maintain longer immunity against tetanus.

Complications of tetanus also should be managed till the spontaneous recovery of neurological functions. Muscle spasms can be controlled with sedatives (usually benzodiazepines) or neuromuscular blocking agents in the ICU setting. Magnesium sulfate infusion (0.5 to 1mg/kg/hour) is used for the stabilization of autonomic dysfunction as well as for additional control of muscle spasms [10]. Autonomic hyperactivity can be treated with IV labetalol (0.25 to 1 mg/min) or IV morphine sulfate (0.5 to 1mg/kg/hour).

Regular vaccination with tetanus toxoid is an important measure for prevention of tetanus. In Sri Lanka, the National Expanded Programme of Immunization (EPI) schedule consists of a total six doses of tetanus vaccination (3 doses during infancy, DPT at 18 months of age, DT at 5 years and aTd at 12 years of age). In the first pregnancy, an additional booster dose of tetanus toxoid is given to women [10] But the presence of most new cases of tetanus in the USA being in the elderly population [3] suggests that there is a reduction in the protective effect of the primary vaccination in elderly due to dropping of antibody titres [11].

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Conclusion

Active immunization of the elderly population should be strongly considered to prevent mortality and morbidity due to tetanus as immunity against tetanus is poor in the geriatric population.

References

1. Bennett JE, Dolin R, Blaser MJ. Mandell, Douglas, and Bennett's Principles and Practice of Infectious Diseases: 2-Volume Set: Elsevier Health Sciences; 2014.
2. Hinfey P. Tetanus: Background pathophysiology, etiology. Medscape. 2017
3. Budd A, Blanton L, Grohskopf L, et al. Manual for the surveillance of vaccine-preventable diseases. Centers for Disease Control and Prevention. 2017.
4. Bytchenko B. Geographical distribution of tetanus in the world, 1951-60. A review of the problem. Bull World Health Organ. 1966;34(1):71-104. PMID: 5325628; PMCID: PMC2475959.
5. Woldeamanuel YW, Andemeskel AT, Kyei K, Woldeamanuel MW, Woldeamanuel W (2016) Case fatality of adult tetanus in Africa: Systematic review and meta-analysis. J Neurol Sci 368: 292-299. https://doi.org/10.1016/j.jns.2016.07.025
6. Isono H, Miyagami T, Katayama K, Isono M, Hasegawa R, Gomi H, Kobayashi H. Tetanus in the Elderly: The Management of Intensive Care and Prolonged Hospitalization. Intern Med. 2016;55(22):3399-3402. doi: 10.2169/internalmedicine.55.7131. Epub 2016 Nov 15. PMID: 27853091; PMCID: PMC5173516. https://doi.org/10.2169/internalmedicine.55.7131
7. Kwan J, Lim S, Allen SC. Lessons from a case of tetanus in an elderly woman.Postgraduate Medical Journal 1999;75:631-633. https://doi.org/10.1136/pgmj.75.888.631
8. Lai X, Hosyanto FF, Xu L. Risk of Clostridium tetani infection in an elderly patient following hemorrhoid ligation. Journal of International Medical Research. October 2020. https://doi.org/10.1177/0300060520963983
9. Tetanus. ed 6. Atlanta: Centers for Disease Control and Prevention, 2000:4.
10. Thwaites CL, Yen LM, Loan HT, Thuy TTD, Thwaites GE, Stepniewska K, et al. Magnesium sulphate for treatment of severe tetanus: A randomised controlled trial. The Lancet. 2006;368(9545):1436-43. https://doi.org/10.1016/S0140-6736(06)69444-0
11. Epidemiology unit Sri Lanka- Tetanus Fact Sheet [Internet]. Available from: https://www.epid.gov.lk/web/attachments/article/146/Leptospirosis_Fact_Sheet_(English).pdf