

Unprotected People #48

Tetanus

"Tetanus--Puerto Rico, 2002"

"Tetanus—Puerto Rico, 2002" was first published by the Centers for Disease Control and Prevention (CDC) in the July 19, 2002, issue of *Morbidity and Mortality Weekly Report* (MMWR; vol. 51, no. 28). The article discusses three cases of tetanus (two fatal) in men over 60 years of age, serving as a reminder that "adults aged 60 years or greater are at greatest risk for tetanus and tetanus-related mortality." Because almost all tetanus-associated deaths are preventable through adequate vaccination, health-care providers should make sure all patients, including older patients, receive a tetanus booster if they haven't had one in the past ten years. Note: For both routine boosters and managing the wounds of adults, Td (tetanus and diphtheria toxoids) is preferred over TT (tetanus toxoid) alone to enhance protection against diphtheria, to which many adults are also susceptible.

February-May 2002, the Puerto Rico Department of Health (PRDOH) received reports of three tetanus cases, two of which were fatal. The last reported case of tetanus in Puerto Rico had occurred in 1999. This report summarizes the investigations of these three cases, which underscore that health-care providers should ensure that all patients have been vaccinated fully against tetanus (1,2).

Case Reports

Case 1. On December 19, 2001, a man aged 86 years with a history of hypertension and coronary artery disease (CAD) sustained a splinter in his right hand while gardening. On December 22, the patient saw a physician for wound care. At that time, he was not treated with either a tetanus toxoid vaccine or prophylactic tetanus immune globulin (TIG). His tetanus vaccination history was not documented in the medical record; he had no history of military service.

On December 26, the patient received treatment

for pharyngitis from a local physician. On December 29, he presented to an emergency department (ED) with difficulty talking, swallowing, and breathing and with chest pain and disorientation of 2 days' duration. He was admitted to a general medicine ward with a preliminary diagnosis of stroke.

On January 2, 2002, the patient had neck rigidity and respiratory failure requiring tracheotomy and mechanical ventilation and was transferred to the intensive care unit (ICU) with tetanus diagnosed. He was administered a dose of tetanus and diphtheria toxoids (Td); TIG was ordered but was unavailable. On January 11, the patient received nonspecific intravenous immune globulin (pooled plasma, 7.5 grams). His hospital course was complicated by two myocardial infarctions, congestive heart failure, a lacunar stroke, and pneumonia. He died on February 2.

Case 2. On April 18, 2002, a man aged 68 years with a history of diabetes mellitus, CAD, and mitral valve replacement sustained a puncture wound in his right foot from stepping on a rusted nail. His spouse cleaned the wound with a surface antiseptic (benzalkonium chloride). The following day, the patient sought care from a primary-care physician who administered intravenous cefazolin and prescribed oral ciprofloxacin and oxycodone. The patient requested vaccination against tetanus but was told that the vaccine was unavailable. The patient did not know if he had been vaccinated previously against tetanus; he had not served in the military.

On April 22, the patient presented to an ED complaining of difficulty swallowing, mild shortness of breath, abdominal pain, throat pain, and mandibular rigidity. On physical examination, he had trismus, risus sardonicus, muscular rigidity, and difficulty speaking. He was admitted to the ICU with diagnoses of suspected tetanus and right foot cellulitis.

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He was treated with metronidazole, ciprofloxacin, and midazolam by continuous intravenous infusion. On April 23, the patient had seizures and respiratory failure requiring mechanical ventilation. He also was given intramuscular TIG (500 units) and Td (0.5 cc) at that time. Despite midazolam therapy and supplemental diazepam for seizures, the patient's muscle spasms persisted. He died on April 27.

Case 3. On April 10, 2002, a man aged 76 years with a history of hypertension sustained a splinter in his right hand. On April 18, the patient experienced weakness and dysphagia, and on the following day, trismus. At that time, he was treated for otitis media but refused Td vaccination. His previous tetanus vaccination status was unknown; he had not served in the military.

On April 20, the patient presented to an ED with difficulty walking, talking, and swallowing. He did not report any wound history to the attending physician. He was treated with an intramuscular corticosteroid injection and an antihistamine. On April 21, the patient sought care at another ED. He was admitted to the ICU with diagnosed tetanus and intubated preemptively. On April 22, he received 3,000 units of TIG and was started on metronidazole. His course was complicated by methicillin-sensitive *Staphylococcus aureus* pneumonia and pseudomembranous colitis. He was released from the hospital on June 17.

Case Summary

During January 1990-April 2002, PRDOH received reports of 20 cases of tetanus (average annual incidence rate: 0.04 per 100,000 population). Of these, 18 (90%) were in men; the median age was 70 years (range: 55-86 years). Among the 11 (55%) for whom supplemental information was available, none had a definite history of previous vaccination with tetanus toxoid. Five (25%) patients had a history of diabetes mellitus. The overall case-fatality rate was 68%.

As a result of the Td shortage affecting the United States during 2000-2002, PRDOH instituted a protocol in March 2001 consistent with the modified guidelines for Td use during the shortage (3,4). Priority was given to persons requiring prophylaxis for

wound management and to persons who had previously received fewer than 3 doses of tetanus-containing vaccine, and routine Td boosters in adolescents and adults were deferred. The shortage reduced Td use in Puerto Rico by 67% during 2000-2001 (Puerto Rico Immunization Program, unpublished data, 2002).

In response to the recent tetanus cases, PRDOH has 1) continued reminding health-care providers of the increased risk for tetanus among persons aged 60 years or greater and those with no history of primary vaccination against tetanus; 2) promoted an increase in the availability of TIG for prophylactic and therapeutic use; and 3) notified physicians that the Td shortage has ended and that Td is available for routine indications (5).

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Editorial Note:

Tetanus is a rare disease in the United States; following the introduction of vaccination with tetanus toxoid in the 1940s, the overall incidence of tetanus declined from 0.4 per 100,000 population in 1947 to 0.02 during the latter half of the 1990s. The overall case-fatality ratio declined from 91% to 11% during the same period. The majority of tetanus cases reported during 1989-1997 occurred in persons who had not completed a 3-dose primary tetanus toxoid vaccination series or for whom vaccination histories were uncertain; no tetanus deaths occurred in persons who received primary tetanus vaccination (5-7; CDC, unpublished data, 2002).

Adults aged 60 years or greater are at greatest risk for tetanus and tetanus-related mortality (5-7). During 1998-2000, the average annual incidence of tetanus in persons aged 60 years or greater was 0.03 with a case-fatality ratio of 31%, both more than twice that of adults aged <60 years. The increased risk for tetanus with increasing age is thought to be

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related to the lower prevalence of protective immunity in older age groups. Protective levels of antibodies against tetanus toxoid decline with age; by age 70 years, only 30% of the population is protected (8). Older persons might never have received a primary vaccination series or might not have received subsequent Td boosters. Women are significantly less likely to be protected against tetanus than men (8) probably, in part, because women are less likely to have received a Td booster in conjunction with military service.

The Td shortage during 2000-2002 necessitated deferral of routine Td boosters in adolescents and adults. However, booster doses given as part of wound management and administration of primary series in unvaccinated persons remained priorities (3). Previous reports on tetanus cases occurring in the United States during the 1980s and 1990s indicated that even during periods in which Td was in ample supply, <60% of persons for whom Td was indicated received a dose during wound management (5-7).

Recommendations for the use of Td and TIG for wound care depend on the nature of the wound and the patient's vaccination history. Persons who have received a primary tetanus vaccination series but who have not had a Td booster during the 10 years preceding any injury should receive a booster dose. Persons who present with wounds contaminated with dirt, feces, or saliva, deep wounds, or wounds with necrotic tissue and who have not had a booster during the preceding 5 years also should receive a dose of Td. Persons who have never received tetanus vaccination or those with unknown or uncertain vaccination histories should receive the first dose of a primary series at the time of presentation. These patients also should receive TIG (250 units injected intramuscularly at a site distant from that used for Td administration) unless the wound is superficial and clean, because a single dose of Td in the absence of previous tetanus vaccination will not induce the production of protective levels of antibody. Therapeutic TIG (3,000-6,000 units as 1 dose) should be administered as soon as possible to any patient presenting with tetanus (9).

The majority of cases of tetanus and virtually all tetanus-associated deaths are preventable through adequate vaccination. Because all wounds, even minor and relatively clean wounds, confer a risk for tetanus, health-care providers should review the vaccination status of all patients and administer indicated tetanus toxoid vaccine to keep their patients fully protected (1,2).

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