



## Infection report / Immunisation

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### Tetanus in England and Wales: 2015

*Tetanus is a life-threatening but preventable infection. From January to December 2015 only six cases were reported in England and Wales; one tetanus-related death was recorded during this period. This report updates the HPR annual report for 2014 [1] and reiterates current recommendations on diagnosis and clinical management of cases. Data sources for the enhanced surveillance of tetanus include notifications, reference and NHS laboratory reports, death registrations, and individual case details – such as vaccination history, source of infection and severity of disease – obtained from hospital records and general practitioners.*

Five cases of tetanus were identified in England between January and December 2015; one case was reported from Wales. Tetanus is a notifiable disease under the Public Health (Control of Disease) Act 1984 (as amended) and accompanying regulations [2]. During 2015, notifications were only received for three cases, one of which was subsequently reclassified as not being due to tetanus. The other four cases of clinical tetanus reported here were all identified due to local clinicians contacting PHE for advice on suspected cases.

The six cases were aged 50 to 85 years old. One case, a female, was born after 1961 and therefore had been eligible for routine childhood vaccination [3]. Of the five cases born prior to 1961, one male was aged between 45 and 64 years of age and four (three female and one male) were aged over 64 years, the age group which historically has been the most affected by tetanus [4].

Unlike the previous year, where five of seven cases occurred in June and July, two of the cases occurred in April, two occurred between June and August, and two occurred in October. All of the cases had a history of injury. Five cases sustained lacerations or puncture wounds in the home or garden, and one sustained injuries in a park.

Three of the cases sought treatment at the time of exposure; all had their wounds dressed and two were given antibiotics, but there was no record of post-exposure prophylaxis being offered to any of the cases. No cases were identified among people who inject drugs (PWIDs) [5].

The case born after 1961 had received four of the recommended five doses of a tetanus containing vaccine for an adult; however, the most recent dose was more than 20 years ago. Among the five cases born prior to 1961 four were known to be unimmunised. No vaccination history was available for the remaining case, however, given they were over 75 years of age they were unlikely to have been immunised.

All six cases received tetanus immunoglobulin (TIG) or human normal immunoglobulin (HNIG) during their admission to hospital. One presented with mild symptoms (grade 1), two presented with moderate symptoms (grade 2), and three had severe symptoms (one grade 3a and two grade 3b) including one fatality. The partially immunised case had moderate symptoms (grade 2).

Pre-immunoglobulin blood samples from four of the cases were sent to the Respiratory and Vaccine Preventable Bacteria Reference Unit (RVPBRU) for anti-tetanus antibody testing. Two of the cases had levels of antibodies against tetanus that may be considered to confer protection ( $>0.1$  IU/ml) at the time the sample was taken. However, in both cases the attending clinician still considered these cases to be clinical tetanus. The remaining two cases did not have 'protective' levels of antibodies.

One death due to tetanus in an unimmunised female in her mid-eighties was reported during this period (case fatality rate 16.7%; 1/6). There was no record of her having received prophylaxis at the time of injury and was admitted into hospital four days after exposure where she received immunoglobulin based on clinical presentation of severe tetanus.

During 2015, a further seven suspected cases of tetanus were investigated by PHE; all (four men and three women) were adults aged between 20 to 72 years old. Blood samples from three of the cases were sent to RVPBRU; all were found to have 'protective' levels of antibodies against tetanus ( $>0.1$  IU/ml) [6]. In each case tetanus was excluded from the diagnosis by the attending clinician.

### **Background, diagnosis and clinical management**

Tetanus is a life-threatening but preventable disease caused by a neurotoxin (tetanospasmin, TS) produced by *Clostridium tetani*, an anaerobic spore-forming bacterium. Tetanus spores are widespread in the environment, including in soil, and can survive hostile conditions for long periods of time. Transmission occurs when spores are introduced into the body, often through a puncture wound but also through trivial, unnoticed wounds, chronic ulcers, injecting drug use, and occasionally through abdominal surgery. Neonatal tetanus is still common in the developing world where the portal of entry is usually the

umbilical stump, particularly if there is a cultural practice of applying animal dung to the umbilicus. Tetanus is not transmitted from person to person. The incubation period of the disease is usually between three and 21 days, although it may range from one day to several months, depending on the character, extent and localisation of the wound.

Tetanus immunisation was introduced in the 1950s and became part of the national routine childhood programme in 1961. Since then, vaccine coverage at two years of age has always exceeded 70% in England and Wales and since 2001 has been around or above 95%, the target coverage set by the World Health Organization (WHO). The objective of the immunisation programme in the UK is to provide a minimum of five doses of tetanus-containing vaccine at appropriate intervals for all individuals. As there is no herd immunity effect, individual protection through vaccination is essential. In most circumstances, a total of five doses of vaccine at the appropriate intervals are considered to give satisfactory long-term protection, and routine boosters every 10 years are no longer recommended [2].

Tetanus is usually confirmed by a clinical diagnosis alone, although three diagnostic laboratory tests are available: detection of tetanus toxin in a serum sample, isolation of *C. tetani* from the infection site, and demonstrating low levels or undetectable antibody to tetanus toxoid in serum. The first two tests provide microbiological confirmation, whereas the third can only support the diagnosis [6].

Clinical management of tetanus includes administration of TIG, wound debridement, antimicrobials including agents reliably active against anaerobes such as metronidazole, and vaccination with tetanus toxoid following recovery. Early treatment with TIG can be lifesaving. As the supply of TIG is limited to the use of TIG is restricted to patients requiring treatment for suspected tetanus. Where a suitable TIG stock cannot be sourced, Public Health England recommends that HNIG for intravenous use may be used as an alternative for treatment of clinical tetanus. For tetanus prone wounds requiring prophylactic TIG, HNIG for subcutaneous use may be given intramuscularly as an alternative to TIG [7]. It is most important that a blood sample for the detection of tetanus toxin or the determination of anti-tetanus antibodies is collected BEFORE the administration of TIG or normal human immunoglobulin [7] and to maximise toxin detection is collected as close to onset of neurological symptoms as possible, preferably within two days. This is because toxin binds rapidly to the active site and is removed from the circulatory system.

## References/notes

1. PHE (2015). Tetanus (England and Wales): 2014. *HPR* **9**(18): immunisation.
  2. PHE (October 2012). Notifications of Infectious Diseases (NOIDs).
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  6. PHE (March 2013). Information for Health Professionals.
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