



## Infection report / Immunisation

Volume 11 Number 13 Published on: 31 March 2017

### Tetanus in England: 2016

- Tetanus is a life-threatening but vaccine-preventable infection.
- From January to December 2016 only four cases were reported in England.
- No tetanus related deaths were recorded during this period.

This article updates the 2015 *HPR* report on surveillance data for England and Wales covering that period [1] and reiterates current recommendations on diagnosis and clinical management of tetanus. 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.

Four cases of clinical tetanus were identified in England between January and December 2016. Tetanus is a notifiable disease in accordance with the amended *Public Health (Control of Disease) Act 1984* and accompanying regulations [2]. During 2016, only one case was formally notified but was subsequently reclassified as not being due to tetanus. Two of the four cases were identified due to local clinicians contacting PHE for advice on suspected cases; two cases were identified during a retrospective review of potential cases.

The four cases were aged 25 to 73 years old; two were male. Three cases were born after 1961 and therefore eligible for routine childhood vaccination [3]. Those born prior to 1961 have historically been the most affected by tetanus [4,5].

Cases occurred in April, July, August, and December, and three of the four were reported from in the South West. All of the cases had a history of injury, one case sustained an injury in the home/garden, one at a beach, and one was injured in the street/road.

The setting of the injury was unknown for a 25-44 year old male was identified among people who inject drugs (PWID). This case had previously been diagnosed with mild clinical tetanus (spasms only) in 2010, however, no other cases identified through the enhanced surveillance

system have been recorded as having more than one episode of tetanus. Additional information, including pre-serum antibody titres, was not available.

Only one case sought treatment at the time of exposure and was given antibiotics, but there was no record of post-exposure prophylaxis being offered.

None of the cases were confirmed as having received the recommended five doses of tetanus-toxoid containing vaccine. Immunisation history was known for two of the three cases born after 1961. One had received four doses of vaccine and one had received two doses; however, in both cases the most recent dose was more than 20 years ago. The immunisation status of the PWID was unknown. The case born prior to 1961 was known to have received two doses of a tetanus-toxoid containing vaccine.

All four cases received tetanus immunoglobulin (TIG) or human normal immunoglobulin (HNIG) during their admission to hospital. Two presented with mild symptoms (grade 1), one presented with moderate symptoms (grade 2), and one, the PWID, had severe symptoms (3a). All of the cases survived their infection.

Pre-immunoglobulin blood samples from two of the cases were sent to the Respiratory and Vaccine Preventable Bacteria Reference Unit (RVPBRU) for anti-tetanus toxoid IgG antibody testing and were found to have levels of antibodies 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.

During 2016, a further nine suspected cases of tetanus were investigated by PHE. Eight (seven men and one woman) were adults aged between 17 to 79 years old and one was a male child under five years old. Blood samples from seven of the cases were sent to RVPBRU; all were found to have 'protective' levels of anti-tetanus toxoid IgG antibodies ( $>0.1$  IU/ml) [6]. In each case tetanus was excluded from the diagnosis by the attending clinician.

### **Background, diagnosis, 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 [3]. 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.

Tetanus is usually confirmed by a clinical diagnosis alone, although three laboratory tests are available to assist microbiological investigation: 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 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, the specimen 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 (2016). Tetanus (England and Wales): 2015. *Health Protection Report* **10**(13),
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