Tetanus in England: 2017

Health Protection Report
Volume 12  Number 18
25 May 2018
Tetanus in England: 2017

- Tetanus is a potentially life-threatening but preventable infection.
- From January to December 2017 there were five cases were reported in England.
- No tetanus related deaths were recorded during this period.

**Cases of tetanus in England in 2017**

This article updates the 2016 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. Cases of tetanus are known to be unreported. A comparison of surveillance data to hospital episode statistics during the time period 2001 until 2014 suggested that tetanus was under-reported by 88% during that period (4).

Five cases of clinical tetanus were identified in England between January and December 2017. Tetanus is a notifiable disease in accordance with the amended *Public Health (Control of Disease) Act 1984* and accompanying regulations (2). During 2017, formal notifications were received for four of the five cases, one of which was subsequently reclassified as not being due to tetanus. One of the five cases was identified due to local clinicians contacting PHE for advice on suspected cases and the other case was identified during a retrospective review of potential cases.

The five cases were aged 26 to 81 years old; one was male and the other four were female. Of the five cases, three cases were born before 1961 when routine childhood vaccination was introduced in the UK (3, 4). Cases occurred in February, March, April, October and November. All of the cases had a history of injury sustained in a variety of settings, one in the home/garden, another in the street/road, one was injured at work as a cleaner and one at a beach overseas. The other case had a scratch of unknown origin.

Two presented with localised tetanus/mild symptoms (grade 1), one presented with moderate symptoms (grade 2), and two, had severe symptoms (3b) (8). All of the cases survived their infection. Vaccination status was likely to be associated with severity of disease: the localised
cases were in individuals born after 1961, while the moderate and severe cases (grade two and three) were in partially immunised individuals, including an individual who had received five doses of vaccine, but not at the appropriate intervals. One of the two localised cases born after 1961 was confirmed as having received the recommended five doses of tetanus toxoid containing vaccine. The other had an unclear vaccination history and was not UK born. Immunisation history was unclear for two of the three cases born before 1961. One severe case had received a single tetanus toxoid containing vaccine 15 years previously, but there was no documentation of primary vaccination. The moderately severe case had an unknown vaccination history, but had possibly received vaccination during military service. The other severe case born, though born before 1961, had received five doses of tetanus-containing vaccine, but not according to a recognised catch-up schedule, having received two sets of two primary doses at approximately 30 and 40 years old, and a booster dose approximately 15 years prior to their illness.

Four cases sought treatment at the time of exposure, two were given antibiotics and three were given tetanus toxoid booster, but only one was recorded as being given post-exposure prophylaxis with anti-tetanus immunoglobulin, despite the recommendation that all cases with unknown vaccination status should be offered prophylaxis with Tig (8). All five cases received tetanus immunoglobulin (TIG) or intravenous immunoglobulin (IVIG) during their admission to hospital.

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. One severe and one moderate case had very low levels of anti-tetanus antibodies and were not considered immune (<0.01IU/ml). The two cases who had received five doses of vaccine were found to have levels of antibodies against tetanus that may be considered to confer protection (>0.1 IU/ml) at the time the sample was taken, despite one of them developing a severe case of tetanus. Only one case was confirmed by culture of C. tetani or PCR detection of the neurotoxin gene. However, in all cases the attending clinician still considered these cases to be clinical tetanus.

**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 (6). 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 (7).

Tetanus is usually diagnosed on clinical grounds alone, although three diagnostic laboratory tests are available to support diagnosis: detection of tetanus toxin in a serum sample, isolation of \textit{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 (8).

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 an intravenous (IV) TIG product is no longer available in England, Public Health England recommends that intravenous immunoglobulin (IVIG) is used as an alternative for treatment of clinical tetanus. Since the supply of intramuscular (IM)TIG is also limited, for tetanus prone wounds requiring prophylactic IM-TIG, HNIG for subcutaneous use may be given intramuscularly as an alternative to TIG (9). 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 (8) and to maximise toxin detection, the specimen is collected as close to onset of neurological symptoms as possible, preferably
within 2 days. This is because toxin binds rapidly to the active site and is removed from the circulatory system. Debridement of wounds is clinically beneficial and wound samples provide an alternative sample for the isolation of *C. tetani* or detection of toxin by PCR, which is increasingly the most useful test to support diagnosis. Absence of toxoid detection or the presence of anti-tetanus antibodies do not, however, rule out the presence of clinical tetanus.

**References**


About Public Health England

Public Health England exists to protect and improve the nation’s health and wellbeing, and reduce health inequalities. We do this through world-class science, knowledge and intelligence, advocacy, partnerships and the delivery of specialist public health services. We are an executive agency of the Department of Health, and are a distinct delivery organisation with operational autonomy to advise and support government, local authorities and the NHS in a professionally independent manner.

About Health Protection Report

Health Protection Report is a national public health bulletin for England and Wales, published by Public Health England. It is PHE’s principal channel for the dissemination of laboratory data relating to pathogens and infections/communicable diseases of public health significance and of reports on outbreaks, incidents and ongoing investigations.

Public Health England, Wellington House, 133-155 Waterloo Road, London SE1 8UG
Tel: 020 7654 8000 www.gov.uk/phe
Twitter: @PHE_uk Facebook: www.facebook.com/PublicHealthEngland

Queries relating to this document should be directed to: Department of Immunisation, Blood Safety and Hepatitis, National Infection Service, PHE Colindale, 61 Colindale Avenue, London NW9 5EQ
immunisation-lead@phe.gov.uk

© Crown copyright 2018
You may re-use this information (excluding logos) free of charge in any format or medium, under the terms of the Open Government Licence v3.0. To view this licence, please visit OGL or email psi@nationalarchives.gsi.gov.uk. Where we have identified any third party copyright information you will need to obtain permission from the copyright holders concerned.

Published: May 2018
PHE publications gateway number: May 2018

PHE supports the UN Sustainable Development Goals