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Tetanus in England and Wales: 2014

Tetanus is a life-threatening but preventable infection. From January to December 2014 only seven cases were reported in England; and one tetanus-related death was recorded during this period. This report updates the HPR annual report for 2013 [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.

Seven cases of tetanus were identified in England between January and December 2014; no cases were reported from Wales. Tetanus is a notifiable disease under the Public Health (Control of Disease) Act 1984 (as amended) and accompanying regulations [2]. During 2014, notifications were only received for four cases, one of which was subsequently reclassified as not being due to tetanus. The other four tetanus cases reported here were identified due to local clinicians contacting PHE for advice on a suspected case.

The seven cases were aged 15 to 87 years old. Two cases, one male and one female, were born after 1961 and therefore eligible for routine childhood vaccination [3]. Of the five cases born prior to 1961, two (one male and one female) were identified among 45-64 year olds and three (two female and one male) were aged over 64 years, the age group which historically has been the most affected by tetanus [4].

Five of the cases occurred during June and July. All of the cases had a history of injury. Four cases sustained lacerations in the home or garden, the other three sustained injuries in the street, at a horse stable, and in a woodland. Only one of the cases sought treatment at the time of exposure; their wound was dressed but there was no record of post-exposure prophylaxis being offered. No cases were identified among people who inject drugs (PWIDs) [5].

Among the two cases born after 1961, one was fully immunised having received five doses of tetanus-containing vaccine and one was age appropriately immunised having received four doses of vaccine. Among the five cases born prior to 1961; one was partially

immunised having received four doses of vaccine, two were known to be unimmunised. No vaccination history was available for the remaining two cases, however, given their age (75+ years old) they were unlikely to have been immunised.

All seven cases received tetanus immunoglobulin (TIG) or human normal immunoglobulin (HNIG) during their admission to hospital. Three presented with mild symptoms (grade 1), one presented with moderate symptoms (grade 2), and three had severe symptoms (grade 3) including one fatality. The two age-appropriately immunised cases had mild symptoms, which is consistent with previous reports [1]. A partially immunised case had moderate symptoms (grade 2).

Samples from six of the cases were sent to the Respiratory and Vaccine Preventable Bacteria Reference Unit (RVPBRU). Three of the cases had protective levels of antibodies against tetanus (>0.1 IU/ml) at the time the sample was taken; however, the attending clinician considered these cases to be clinical tetanus. The remaining three cases did not have protective levels of antibodies; *C. tetani* was cultured from wound swabs for two of these cases.

One death due to tetanus was reported during this period (case fatality rate 14.3%; 1/7) in an 80+ year old female. The immunisation status of the case was not known and there was no record of the case having received prophylaxis at the time of exposure. The case was admitted into hospital and received immunoglobulin based on clinical presentation of severe tetanus.

During 2014, a further nine suspected cases of tetanus were investigated by PHE; all (five men and four women) were adults aged between 27 to 81 years old. Samples from six of the cases were sent to RVPBRU; five were found to have protective levels of antibodies against tetanus (>0.1IU/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 [7].

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 (2014). Tetanus (England and Wales): 2013. *HPR* **8**(12): immunisation. Available online at: https://www.gov.uk/government/publications/tetanus-in-england-and-wales-2013/tetanus-in-england-and-wales-2013

2. Notifications of Infectious Diseases (NOIDs) (October 2012).

3. Department of Health (2006). Immunisation against infectious disease. Chapter 30. Tetanus. Available at

4. Rushdy AA, White JM , Ramsay ME, Crowcroft NS (2003). Tetanus in England and Wales 1984-2000. *Epidemiol Infect* 130: 71-7.

5. Hahne SJM, White JM , Brett M, George R, Beeching NJ, Roy K, et al (2006). Tetanus emerges in injecting drug users in the UK [letter]. *Emerg Infect Dis* **12**(4): 709-10.

6. PHE website (March 2013). Information for Health Professionals.

7. PHE website (March 2013). HPA recommendation on the treatment and prophylaxis of tetanus.