

Letter to the Editor

## Tetanus in an Unvaccinated Amish Woman After a Breech Home Delivery in Kentucky, 2016

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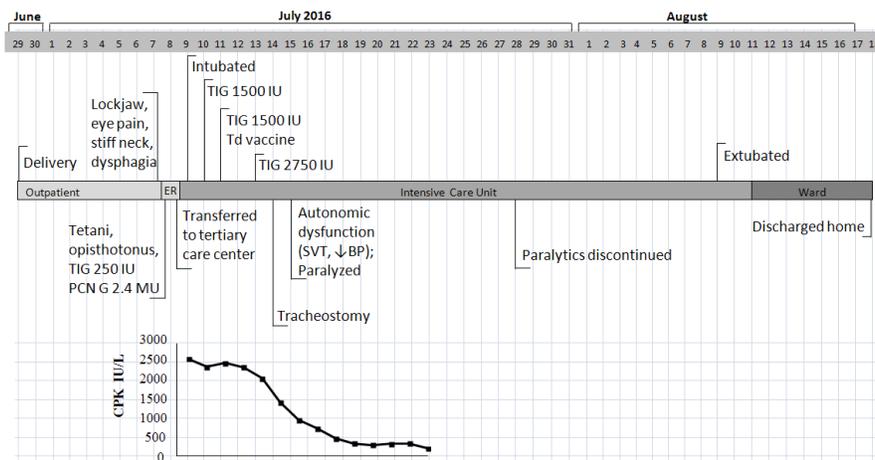
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Dear Editor,

In July 2016, an Amish 30-year-old woman with no previous history of vaccinations presented to a local community hospital with a 48-hour history of tingling of her jaw that progressed to trismus, eye pain, neck stiffness, dysphagia, and opisthotonos. Ten days before her hospital presentation, she underwent a breech delivery at home on a farm in rural Kentucky.

Tetanus was suspected at an outlying hospital where a partial dose of tetanus immune globulin and penicillin G were administered prior to her transfer to a tertiary care hospital. Her vital signs were normal. The patient was conscious, lying on her side with her neck arched back, jaw clenched. Because of laryngospasm and to prevent respiratory failure, the patient required intubation and mechanical ventilation. She continued to experience upper extremity contractures in response to any external stimuli; proximal greater than distal. She also experienced intermittent episodes of stiffening followed by tonic-clonic motion of her extremities. Initial laboratory values were within normal limits except for an elevated creatinine phosphokinase (CPK) of 2,352 IU/L (**Figure 1**).

To eliminate ongoing potential source of infection from the uterus, dilation and suction curettage was performed, with limited products of conception removed and specimens sent for Gram stain, culture, and pathology evaluation. Considering the patient's history of an absence of tetanus vaccination, muscle spasms, and increased CPK, the diagnosis was narrowed exclusively to tetanus, and broad-spectrum therapy was de-escalated to metronidazole. In addition, the remaining dose of immune globulin was administered intramuscularly to complete a total dose of 6000 IU. Active vaccination with tetanus and diphtheria vaccine was provided. The Gram stain from the uterine sample revealed no organisms, the culture was negative, and pathology reported severe acute inflammation and necrosis. One week after hospitalization, she developed diaphoresis and severe upper extremity contractures provoked with minimal external stimuli and other complications (**Figure 1**). She was eventually discharged home in stable condition after a 41-day hospitalization. A public health response was initiated by the state and local health departments to prevent additional cases through vaccination (Yaffee *et al.*, 2017).



**Figure 1** Sequential disease progression and increasing creatinine kinase coinciding with treatment of tetanus.

CPK = Creatine phosphokinase; PCN = penicillin; SVT = supraventricular tachycardia; TIG = tetanus immune globulin.

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*Clostridium tetani*, a Gram-positive ubiquitous bacillus, can survive as a spore for extended periods in soil and adverse conditions, and cause disease when spores enter the body through skin/mucosal breaks. It is difficult to culture because of sensitivity to oxygen; therefore, the diagnosis is clinical (Murray, Rosenthal, and Pfaller, 2017). Muscle rigidity and spasm (e.g., trismus and opisthotonos) are the pathognomonic hallmarks for generalized tetanus and can rapidly progress to severe muscular spasm, respiratory failure, and autonomic dysfunction.

Treatment is to remove the infection source and reduce toxin production (Roper *et al.*, 2012), while administering immune globulin as soon as possible. Supportive care also plays a crucial role. Metronidazole is the first choice for antibiotic or penicillin as an alternative (Roper *et al.*, 2012). Paralytics are often used to alleviate the spasms (Dutta, Das, Sethuraman, and Swaminathan, 2006). Botulinum toxin has also been used for this purpose (Hassel, 2013). Tetanus is uncommon in the US with <50 reported cases each year. Physicians should have a heightened suspicion of tetanus when dealing with unvaccinated

populations who may have had labor trauma.

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