Unexpected outcome (positive or negative) including adverse drug reactions

Needlestick and infection with horse vaccine

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Summary

This report describes a case of accidental needlestick injury involving a live equine vaccination, Equilis StrepE. A vet presented herself to the Emergency Department having accidentally injected herself with an equine vaccination. Her left thumb (injury site) was inflamed and had lymphangitis progressing proximally along her left arm. Her inflammatory markers were not raised. The swelling, erythema and lymphangitis had improved markedly with intravenous antibiotics. She had no sequelae at follow-up. Equilis StrepE is a vaccine for submucosal administration containing a modified live avirulent strain of *Streptococcus equi* subspecies *equi* (Strain TW). Group C streptococci infections are pathogenic in horses and uncommon in humans. A search of the literature revealed no prior case report of similar adverse reaction to this vaccine. The vaccine may have harmful effect on human health, if injected accidentally but more evidence needs to be collected.

BACKGROUND

This report describes a case of accidental needlestick injury involving a live equine vaccination, Equilis StrepE. A significant adverse reaction occurred, which would not have been expected in a human recipient. No previous reaction of this type had been documented before, and, therefore, it was felt to be important to have this published in the literature, given the unpredictable nature of animals and the risk of needlestick injury to the vet when vaccinating them.

CASE PRESENTATION

A female vet presented herself to the Emergency Department (ED) of teaching hospital within an industrial city having accidentally injected herself with an equine vaccination, Equilis StrepE, the day before. She had been vaccinating a horse who struggled and caused her to self-inject. She was not wearing gloves. She had initially bled the site and had self-medicated with two doses of co-amoxiclav 375 mg. However, she attended ED the following day as the inflammation had increased around the puncture site and had progressed to her left axilla. She had no past medical history of note and was not prescribed any regular medication.

On initial examination, she had mild-grade pyrexia of 37.5 °C. Her left thumb (injury site) was inflamed and had lymphangitis progressing proximally along her left arm. There were palpable, tender, lymph nodes in the left axilla. There were no other systemic signs of infection.

INVESTIGATIONS

Her initial white cell count was $7.2 \times 10^9/l$ (neutrophils $4.97 \times 10^9/l$, lymphocytes $1.65 \times 10^9/l$, basophils $0.05 \times 10^9/l$, eosinophils $0.09 \times 10^9/l$, monocytes $0.56 \times 10^9/l$). Haemoglobin was 13.3 g/dl and platelet count was $249 \times 10^9/l$.

Within 24 h her C-reactive protein was 9.1 mg/l.

Blood cultures (BacT/ALERT; BioMerieux, Marcy l'Etoile, France), taken prior to administration of antibiotics in hospital, showed no growth after 7 days.

TREATMENT

In discussion with the manufacturer of the vaccination and the bacteriologist at the hospital, she was admitted for intravenous antibiotics, namely, amoxicillin 2 g four times a day and clindamycin 900 mg three times a day.

OUTCOME AND FOLLOW-UP

The intravenous course of antibiotics lasted 48 h, over which time the swelling, erythema and lymphangitis had improved markedly. She was discharged home on a 5-day course of oral amoxicillin 500 mg three times a day and clindamycin 300 mg four times a day.

She had no sequelae at 6-month follow-up.

DISCUSSION

Equilis StrepE is a vaccine for submucosal administration containing a modified live avirulent strain of *Streptococcus equi* subspecies *equi* (Strain TW), which is a Lancefield Group C streptococci. It is the causative pathogen in the common equine infective disease known as strangles. It is administered into the horse's upper gum.

This mutant strain has part of a gene essential for the cell's metabolism deleted. Therefore, it cannot replicate in mammalian tissue. As part of its development it was tested for haemolysis, capsule synthesis and sugar fermentation, and in all these respects, it behaved like the original strain.¹

Group C streptococci infections are pathogenic in horses and uncommon in humans. Infection with *S equi* subspecies *equi* in human are rare; only five cases have been reported in the literature since 1980. Two of the cases resulted in meningitis.²

Needlestick injuries in veterinary practice have been reported in the literature, though not to the same extent as human medicine. In their review, Weese and Jack³ note that zoonotic infections and occupational injuries have been overlooked and underappreciated in veterinary medicine. Wilkins and Bowman⁴ surveyed a cohort of

American female veterinary graduates with regard to needlestick injuries and found 50% of needlestick injuries involved vaccines, which caused 13% of the reported side effects. The vast majority of these vaccine-needlestick-injury side effects were mild (84%) and localised (89%). Leggat *et al*⁵ surveyed 1094 Australian veterinarians and found that syringe devices were the commonest (63.7%) cause of needlestick and sharps injuries (NSI) and that their estimated exposure rate of 58.9 contaminated NSI per 100 person years represents a major occupational health problem.

A search of the literature revealed no prior case report of similar adverse reaction to this vaccine. There have been several case reports⁶ of animal vaccines being self-inoculated into digits, resulting in amputations. However, these have mostly been a result of the oil-based nature of the vaccines in those reports that cause increased local compartment pressure and chronic granulomatous inflammation. This vaccine does not contain any other constituents, and, therefore, a significant reaction to it is unusual.

Within the veterinary literature, there have been several reports^{7 8} of subsequent adverse reactions from the Equilis StrepE vaccination occurring in the horses treated. Those reactions observed were lymph-node swelling and formation of lymph-node abscesses. Although these adverse reactions were initially thought to be due to the vaccination, further investigation revealed that the horses in question had a subclinical infection with *S equi* prior to vaccination.

In conclusion, it is likely that the infection and lymphangitis in this report was caused by the high dose of bacteria inoculated which were able to cause localised infection and tissue damage before they died. It is debatable whether infection occurred, as infection implies the multiplication of bacteria within tissue; this strain cannot multiply. However, the injury progressed to localised swelling and inflammation followed by lymphangitis which behaved, from the

clinical perspective, like an infection and improved with antibiotics.

Learning points

- ▶ The vaccine may have harmful effect on human health, if injected accidentally, but more evidence needs to be collected.
- ▶ It is likely that horses will continue to struggle when vets try to inject their gums, and it is likely that needlestick injuries will continue to occur.
- ▶ A safer injecting device, for example, self-sheathing needles, or wearing re-enforced gloves might be more appropriate.

Competing interests None.

Patient consent Obtained.

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