Focus Article: Dourine – an emerging venereal threat to European horses

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Introduction

Following the disclosure of an outbreak of Dourine, due to infection with the protozoan parasite Trypanosoma equiperdum, in Italy earlier in 2011, the Codes of Practice Sub-Committee of the Horserace Betting Levy Board's (HBLB) Veterinary Advisory Committee, undertook its annual review of the Codes of Practice in September 2011. The review concluded that it was timely to include for the first time a specific Code of Practice for Dourine to provide European breeders with guidance as to how to deal with this emerging venereal disease threat. Dourine is a serious and often chronic venereally transmitted disease of horses, which is notifiable by law. There is no proven long term cure for the disease and no vaccine is available, so establishing freedom from disease is the basis of prevention. The following article is based around the HBLB Code of Practice which was drafted by the authors prior to approval as the basis of the HBLB's Code of Practice.

The Disease

Dourine is caused by the protozoan parasite, Trypanosoma equiperdum and is a serious, often chronic, venereally transmitted disease of horses and other equids. Once widespread, dourine has been eradicated from many countries but is still seen in horses in Asia, Africa, South America, southern and eastern Europe, Mexico and Russia and was reported in June 2011 in Sicily and then just north of Naples, on the Italian mainland.

Notification

European Council Directive 90/426 of 26th June 1990 makes dourine compulsorily notifiable in the EU. In the UK, dourine is also notifiable by law under the Infectious Diseases of Horses Order 1987. Under the Order, anyone who owns, manages, inspects or examines a horse, which is affected or is suspected of being affected by the disease must notify Defra via the appropriate Regional Veterinary Lead of Animal Health Veterinary Laboratories Agency (AHVLA). See Defra's website (Click here) for AHVLA contact information.

Under the Order, Defra may declare the premises where disease is suspected to be as an infected place and impose restrictions on horses at those premises. A veterinary inquiry will be carried out under the direction of Defra to determine if dourine is present. The Order provides Defra with powers to enforce measures for vector control and disinfection.

There is currently no proven, effective long-term cure for dourine. Any horse testing positive will be required to remain under official breeding and movement restrictions indefinitely. There are no powers for compulsory humane destruction of infected horses, as a result there is no provision for compensation. Any decision as to the necessity for humane destruction will have to be taken by owners based on economic and welfare considerations.

Clinical Signs

Clinical signs of dourine are highly variable in manifestation and severity. The disease is characterized mainly by swelling of the genitalia, cutaneous plaques and neurological signs but severity varies with the virulence of the strain, the nutritional status of the horse, and stress factors. Clinical signs often develop over weeks or months, frequently waxing and waning with relapses, probably precipitated by stress. This can occur several times before the animal either dies or experiences an apparent recovery. The mortality rate is believed to be in excess of 50%.

Genital oedema and reproductive tract mucopurulent discharges are often the first signs. Mares develop a mucopurulent vaginal discharge, and the vulva becomes oedematous; this swelling may be marked leading to vaginal prolapse and extend along the perineum to the ventral abdomen and mammary gland and may result in depigmentation, similar to that seen in coital exanthema with EHV-3 infection. Abortion can occur with more virulent strains. Stallions develop oedema of the prepuce and glans penis with paraphimosis in some cases, and can develop a mucopurulent urethral discharge. The swelling may spread to the scrotum, perineum, ventral abdomen and thorax and may also become depigmented.

Characteristic raised oedematous patches 2-10 cm in diameter (sometimes called 'silver dollar plaques'; arrowed left) may appear on the skin on the neck, hips, lower parts of the abdomen and particularly over the ribs. These cutaneous plaques usually last for 3 to 7 days and are pathognomonic for the disease, although they do not occur with all infecting strains.

Neurological signs can develop with signs of progressive weakness, incoordination and, eventually, paralysis. Facial paralysis, which is generally unilateral, may be seen in some animals. Conjunctivitis and keratitis are common, and in some outbreaks, ocular disease may be the first sign of dourine and anaemia and intermittent fever may also be found. Dourine also results in a progressive loss of condition and affected animals may become emaciated, although the appetite remains good.

Transmission of Disease

Dourine is caused by the protozoan parasite, *Trypanosoma equiperdum*, which unlike other trypanosomal infections, is sexually transmitted during natural mating or by artificial insemination (AI) with infected semen. Transmission from stallions to mares is more common, but mares can also transmit the disease to stallions. *T. equiperdum* can be found in the vaginal secretions of infected mares and the seminal fluid, mucous exudate of the penis, and sheath of stallions. Periodically, the parasites disappear from the genital tract and the animal becomes non-infectious for weeks to months. Transmission is most likely early in the disease process as non-infectious periods are more common late in the disease. Male donkeys can be asymptomatic carriers and sexually immature animals that become infected can transmit the organism when they mature.

Rarely, infected mares pass the infection to their foals, possibly before birth or through colostrum and milk and infections may also occur through mucous membranes such the conjunctivae. There is currently no evidence that arthropod vectors play a significant role in transmission of dourine, but this possibility cannot be ruled out.

Prevention

There is no vaccine available for dourine. As dourine is primarily a venereal disease, prevention of natural mating or AI with infected horses (stallions or mares) is the most important means of control. Prevention of dourine is therefore based on the establishment of freedom from infection and this is done by testing blood for presence of antibodies against T. equiperdum, which is more reliable than testing for the presence of the protozoan parasite itself.

Any introductions of horses from endemic areas or areas of incursion should be isolated and blood tested for antibodies by compliment fixation test (CFT) or indirect fluorescent antibody test (IFAT). Horses in isolation must not be allowed to mate and semen must not be collected or used for AI until negative dourine test results are confirmed. Any seropositive results, or any horses showing clinical signs of dourine should be reported as required by national law (Defra in UK) and will then be dealt with under official supervision. Dourine should be eradicated from an incursion into a non-endemic area by identification of the source, thorough tracing and testing of all in-contacts and euthanasia of infected and seropositive horses.

Stallions or mares should not leave endemic areas or areas of incursion without veterinary confirmation that:

- The horse(s) has/have not been in contact with cases of Dourine.
- The horse(s) is/are healthy and show(s) no clinical signs of Dourine, prior to leaving
- Negative CFT blood sample result(s) for Dourine, performed by an authorised laboratory, collected within one month of leaving.

On arrival in an area where Dourine does not occur, these stallion(s) or mare(s) should be isolated until repeat negative CFT blood sample result(s) for Dourine, performed by an authorised laboratory, collected 10-14 days after arrival, has been obtained. Under no circumstances should the stallion(s) or mare(s) involved be mated and no semen should be collected and used for AI purposes before this reassurance has been obtained.

Diagnosis

Due to the variability and possible absence of outward signs of dourine, clinical diagnosis is not always possible and laboratory diagnosis is necessary to confirm diagnoses of dourine.

The complement fixation test (CFT) is the prescribed test for international trade, and has been used successfully in eradication programs. Some uninfected animals, particularly donkeys, often have non-specific CFT reactions due to anticomplementary activity of their serum, thereby rendering results difficult to interpret. Indirect fluorescent antibody tests may help to resolve these cases. Enzyme linked immunosorbent assays (ELISAs) and agar gel immunodiffusion (AGID) tests have also been used to diagnose dourine. Although no serological test is specific for dourine as cross-reactions occur with other trypanosomes (especially *T. brucei* and *T. evansi*), this is not a problem where these infections are all considered to be exotic and requiring eradication.

CFT and confirmatory IFAT should always be used to test horses with clinical signs, to test horses that have been in contact with others who have or are at risk of having dourine and

for official export certification. In such cases, serum or clotted blood samples for dourine testing must be sent to the Veterinary Laboratories Agency, Weybridge.

Definitive diagnosis by identification of the parasite is not undertaken for routine screening as the organisms are extremely difficult to find and are usually not detectable in blood smears. *T. equiperdum* cannot be distinguished microscopically from *T. evansi*.

Control of infection

If dourine is suspected in any horse, stop all breeding activities immediately, identify and isolate the horse(s) concerned, notify Defra via the appropriate Regional Veterinary Lead of Animal Health Veterinary Laboratories Agency (AHVLA) and seek veterinary advice about the welfare of the horses and the next steps.

If dourine is confirmed, further action will be controlled by Defra. Mating, teasing, collection/insemination of semen and movement of horses on and off the premises must stop until the disease outbreak is confirmed to be over.

Any venereal contacts with confirmed infected horses must be isolated and will be blood tested to determine if they produce antibodies, i.e. to determine if they have become infected.

Inform:

- Owners (or persons authorised to act on their behalf) of horses at, and due to arrive at, the premises.
- Owners (or persons authorised to act on their behalf) of horses that have left the premises.
- Recipients of semen from the premises.
- The national breeders' association.

T. equiperdum is a parasite, which cannot survive outside a living host. It dies quickly with its host. Various disinfectants, including 1% sodium hypochlorite, 2% glutaraldehyde and formaldehyde, as well as heat of 50-60 C, will kill the parasites in the environment, but their transient life outside the host makes this unnecessary, although good stable hygiene is always recommended.

Treatment

There is currently no effective treatment for dourine although treatment has been attempted with quinapyramine sulphate (3 mg/kg, given subcutaneously). However, *T. equiperdum* may persist in asymptomatic carrier horses after treatment and these horses are considered unsafe for breeding purposes.

Any treatment to alleviate the signs of the disease and otherwise support the horse will be determined by the attending veterinary surgeon, until such time as a positive diagnosis is confirmed by CFT. Compulsory slaughter of infected horses to eradicate the infection is considered the best policy.

Acknowledgements

We are grateful to Istituto Zooprofilattico Sperimentale dell' Abruzzo e del Molise (IZS), Teramo, Italy and Dr Paola Gulden, SIVE, Italy for their kind permission to use the accompanying illustration.