The changing nature of the equine disease threat facing the United Kingdom

Richard Newton FRCVS
Animal Health Trust

Overview

- In the headlines
  - Some disease threats to non-equine health
- Drawing parallels with threats to equine health
- Understanding the threats
  - Cross-species; Vector-borne; Re-emerging
- Remembering diseases still close to home
  - Overview of EHV-1
- Some final thoughts on EHV-1……..

Human diseases in the headlines

The Telegraph

Bird flu could be as deadly as the 1918 Spanish flu pandemic
Scientists must be allowed to work on deadly viruses in labs to ward off future outbreaks, Professor Derek Smith argues

Toddler playing with fruit bat sparked Ebola outbreak
The first victim of the Ebola epidemic may have contracted the virus after playing with a bat he found in the hollow of a tree

Zika outbreak 'could infect hundreds of thousands of people in Spain'
Scientists are concerned that the tiger mosquito, which is rife in Spain, could infect hundreds of thousands of people with the Zika virus

Animal disease threats

Schmallenberg virus: Climate 'raising UK disease risk'

Schmallenberg outbreak as calving begins
Friday 20 March 2015 1:12

Fears grow over bluetongue threat to UK
Wednesday 20 January 2016 9:08

Perhaps even more frightening!

The Telegraph

Tuberculosis rates in parts of London higher than Rwanda and Eritrea
Areas of Holloway, Brent, Harrow, Newham and Ealing found to have rates of TB that exceed World Health Organisation's 'high incidence' threshold

Outbreak News Today

Florida reports 5 leprosy cases in first 5 weeks of 2016
Posted by Robert Heritman on February 8, 2016 # 1 Comment

Aren’t these chronic Mycobacterial diseases of antiquity that we had eradicated?
So what has all of this got to do with UK horses?
• They illustrate important *exotic* disease risk features that currently apply to UK horses
• Cross-species transmission of diseases
• Changing global ecology of insect vector-borne diseases
• Re-emergence of old and previously presumed conquered diseases
• **But** don’t forget the *endemic* disease threats!

Cross-species transmission
• Threat of novel influenza strains in equids

**Cross-species transmission**
• Threat of novel influenza strains in equids

**Cross-species transmission**
• Threat of novel influenza strains in equids

**Cross-species transmission**
• Threat of novel influenza strains in equids

---

**Characterization of a New Avian-like Influenza A Virus from Horses in China**

This report characterizes the H3N8 influenza viruses from each outbreak and suggests that the majority of these viruses are of recent avian origin and questions whether the virus could continue to spread or will disappear.

**Isolation and characterization of highly pathogenic avian influenza virus subtype H5N1 from donkeys**

Here we report the isolation of HPAI H5N1 from donkeys living in contact with diseased birds and demonstrate the presence of H5 seropositive ones in the neighbouring areas.

**No effective vaccines immediately available!**

---

Equine H3N8 viruses since Miami in 1963

High mortality H3N8 virus in Jilin, China in 1989
Cross-species transmission

- Hendra virus: from bats to horses to humans

Vector-borne diseases

- WNV: a mosquito-borne threat

An effective vaccine is available
Conclusion
This report highlights the importance in equine medicine of obtaining a thorough case history and having a basic knowledge of equine infectious diseases distribution and clinical presentation.

Vector-borne diseases
Enhanced West Nile virus surveillance in the North Kent marshes, UK

Abundant Cx. modestus populations in wetland areas with large avian populations, particularly migratory birds, and co-incident with livestock and horses are ecosystems at increased risk of WNV introduction and maintenance [26].
Vector-borne diseases

Dealing with the threat of AHS

- African Horse Sickness Working Group
  - Successful Defra/industry liaison
  - Legislation and contingency plan published in 2012

Challenges remain wrt AHS

Summary of the vaccine discussion group at IRESPE seminar on AHS held at OIE, Paris, 29th January 2016:

- Horse trade with Africa remains a concern because of AHS
- Current vaccines, although critically useful in the past, have severe limitations to be globally acceptable
- Equine industries in non-endemic countries are highly reluctant to accept live attenuated AHSV vaccines
- Vaccines represent a vital tool to combat outbreaks of AHS and should be used along with effective diagnostic tests and appropriate surveillance strategies
- The discussion group concluded that safe, cheap, universal and DIVA AHSV vaccines are needed, that can be used safely in any ecosystem or region

Old and conquered – if only!

Italy Responds to Equine Dourine Outbreak

Case of much-feared glanders confirmed in German horse

Swamp fever found in Cornish horse

Old and conquered – if only!

- Re-emergence of old and previously presumed conquered equine diseases
- Dourine (*Trypanosoma equiperdum*)
  - Italy in 2011 and Botswana in 2016
- Glanders (*Burkholderia mallei*)
  - Brazil and Germany in 2015
- Swamp fever (EIA virus)
  - EU regularly since Ireland in 2006
  - Canada + FL, NY, PA in 2016

Old and conquered – if only!

- Re-emergence of old and previously presumed conquered equine diseases
- Dourine (*Trypanosoma equiperdum*)
  - Italy in 2011
- Glanders (*Burkholderia mallei*)
  - Brazil and Germany in 2015
- Swamp fever (EIA virus)
  - EU regularly since Ireland in 2006
  - Canada + FL, NY, PA in 2016

Still NO effective vaccines
Headlines only a year from Rio!

Glanders Detected at 2016 Olympic Equestrian Facilities

Nature of the threat of infectious diseases facing humans and animals is not dissimilar
Emerging and re-emerging infections/zoonoses
- Cross-species transmission
- Insects as vectors
- Changing global distributions
Recognising & understanding these threats are key to prevention & effective control
Although impacts from new diseases may be very large, the burden of endemic disease remains high

Still challenges closer to home…

Redwings Horse Sanctuary confirms strangles outbreak

And some even closer to home…

National Stud in lockdown after equine herpes discovery

Think of EHV-1, think of cold sores (herpes simplex virus-1)

Think of EHV-1, think of cold sores (herpes simplex virus-1)

Unlike true love, herpes lasts forever…
**EHV-1 syndromes**

- Respiratory disease
- Abortion
- Paralysis

**Equine Herpes Virus-1 (EHV-1)**

- EHV-1 can cause respiratory disease, abortion and neurological disease in equids
- **Most horses latently infected** with EHV-1
  - Latent = not always infectious
  - But have potential to become infectious
- Appropriate management of index cases can prevent major problems (Codes of Practice)
  - **Mis-management of them can spell disaster!**
  - Disaster may strike despite good management

**EHV-1’s life cycle…**

- Generational cycles of infection with:
  - Latent infection
    - Most healthy horses are latently infected with EHV from an early age
  - Reactivation of virus
  - Recrudescence of disease

**means EHV-1 is here to stay…**

- **Viral latency is widespread** & difficult to control
- **EHV-1 disease may spontaneously occur** due to re-activation of latent virus
- Affects horses attending all types of events/premises
- **Vaccination is currently not optimal** (or available!) for prevention and/or control of EHV-1

**EHV-1 can only be managed and NOT eradicated**

- EHV-1 has ability for significant disease and death with associated financial and welfare consequences
  - Abortion ‘storms’ affecting multiple mares (UK 2016)
  - Large neurological outbreaks (UK 2012/2013; USA)

**After a quiet 2014 & 2015…**

- Increased EHV-1 activity in TBs in 2016
- Neurological disease
  - The National Stud: more details coming up
  - Training yard in Epsom
- Multiple abortions/foal deaths on studs in
  - Hertfordshire: more details to come from Julian
  - Sussex
  - Suffolk

**The National Stud**

- Large public stud farm on edge of Newmarket
- Purpose built isolation unit (Heath Yard) for mares arriving from overseas separate from the main stud and with dedicated staff
- Incoming animals routinely bled for health monitoring purposes
The National Stud

- 4yo maiden filly developed neurological signs on 26/1/16
  - Ataxia, bladder dysfunction & periods of recumbency (bleed 2)
- Filly was from a pre-training yard in France and travelled by lorry with 2 pregnant mares & another maiden mare
  - Consignment had arrived at Heath Yard on 20/1/16 (bleed 1)
- Filly was NP swabbed 4-times in the following days
  - All samples NEGATIVE for EHV-1 by PCR
- Paired CFT serology though showed seroconversion (1:10 to 1:160) to EHV-1/-4, with samples only 6dd apart between bleeds

The National Stud

- Neurological EHV-1 diagnosed based on serology but case apparently not infectious at time of clinical signs
- Road transport a potential high risk period of exposure for other animals in Heath Yard, esp. co-transported mares
  - 2 co-transported pregnant mares at risk of EHV-1 abortion
  - Inadvertent indirect transmission e.g. isolation unit staff
- Biosecurity measures implemented as per HBLB CoP
- Whole stud closed immediately & issued press release

National Stud in lockdown after equine herpes discovery

The National Stud

- All 24 mares in the isolation unit were screened clear
  - No clinical disease, no seroconversions
  - Post-foaling placenta PCR negative
- Affected filly made good recovery
- 3 mares from France tested negative by PCR on NP swabs on 3 occasions & did not abort or seroconvert
- Main stud re-opened on 15th February 2016 & isolation yard re-opened on 23rd February 2016

Control of EHV-1

- Follow the HBLB Codes of Practice
  - Hard copy printed for TBA members
  - Online at http://codes.hblb.org.uk/
  - Something new…Celia to tell you more next!

Some final thoughts on EHV-1

- There is never zero risk of EHV-1 with horses as they can spontaneously reactivate the virus from a latent state
- No pregnancy should be considered safe wrt EHV-1 until there is a healthy foal at foot that is at least a week old
- Always aspire to ‘wrap pregnant mares in cotton wool’ so minimal stress, in small groups & away from other horses
- EHV-1 abortions pose high infection risks to other mares so must deal with them promptly & appropriately
- Separate potentially exposed mares until they abort or foal
- Routine management & index case handling are arguably more important than vaccination of pregnant mares