ROLE OF THE DROMEDARY CAMELS AS HOST AND VECTOR OF INFECTIOUS DISEASES:

MERS CoV
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A 25 year old student in Jordan began coughing.

On April 25, 2012, he died; and several nurses and doctors developed similar symptoms.

June 13, 2012, 60 year old man in Saudi Arabia admitted to hospital with history of fever, cough, shortness of breath.

On June 24, he died.

June 2012, MERS virus identified.

(from Science, March 28, 2014)
HCOV-EMC A NOVEL BETACORONAVIRUS IDENTIFIED

Sputum sample
Shared less than 90% of amino acid sequences with other known human corona viruses at that time.

Corona viruses:
Enveloped, single-stranded, RNA viruses
Found in humans, birds, cats, dogs, pigs, mice, horses, and whales.
Can cause respiratory, enteric, hepatic, or neurologic diseases

The diversity of corona viruses is related to the high frequency of RNA recombination, and the unusually large genomes for RNA viruses
(from New England Journal of Medicine (11/8/12))
SINCE THEN MERS COV HAS BEEN CONFIRMED

Near Arabian Peninsula
- Saudi Arabia
- United Arab Emirates (UAE)
- Qatar
- Oman
- Jordan
- Kuwait
- Yemen
- Lebanon
- Iran

Travel related
- United Kingdom (UK)
- France
- Tunisia
- Italy
- Malaysia
- Philippines
- Greece
- Egypt
- United States of America (USA)
- Netherlands
- Algeria
- Austria

853 People affected
301 Deaths attributed
(September 2014)
MARCH 2013

Initial concern that camels were involved
Patient from Abu Dhabi, traveled to Germany and died in hospital
Owned racing camels and had close contact with sick camel before he became sick
50 retired racing camels from Oman had antibodies to MERS
Antibodies not found in cow, goats and sheep
Sources of Exposure and Risk Factors

Similar virus found in bats – viral RNA recovered from Egyptian Tomb bat near home of affected Saudi patient.

Man working with camels was healthy but his wife developed MERS.

People with diabetes, renal failure, chronic lung disease, and immunocompromised are considered at higher risk.

Hospital acquired infections.

Concern for travel related to Umra and Hajj.
Over 75% of 200 camels tested in study in Saudi Arabia had viral sequences the same as those found in humans. Antibodies were not found in cow, goats, and sheep.

100% of samples taken from 151 camels in UAE in 2003 had antibodies against MERS-CoV.

MERS-CoV virus has been isolated in camels with antibodies to MERS.
RECENT STUDY IN CAMELS

Work at Colorado State University to be reported in Journal of Emerging Infectious Diseases December 2014

3 camels inoculated with MERS isolate from humans
All three developed upper respiratory symptoms
  Nasal discharge
  Mild temperature increase
Virus isolated from nasal and oral swabs and nasal discharge
No virus detected in blood or urine
CAMELS IN OTHER COUNTRIES

Approximately 27 million camels in the world
260,000 in Saudi Arabia
Approximately 10 million in Africa

Testing of meat from camels originating in Africa and swabs from imported animals have shown antibodies to MERS

MERS CoV should be considered in cases of severe human respiratory infections in Africa
CAMELS AND DISEASE

Body temperature of camels fluctuates - lowest at dawn 35-38.6 C
Vomiting may occur independent of illness
Other diseases of zoonotic significance include:
- Brucella abortus
- Coxiella bumetii
- Leptospira interrogans
- Toxoplasma gondii
- Parainfluenza virus type 3
- Anthrax
- M. bovis
- Camel pox
- Trypanosomiasis
- Sarcoptes scabiei var cameli
- Rabies
- Rift Valley Fever
OIE AND MERS

Working closely with FAO and WHO to collate and share data to gain a better understanding about the disease situation in animals and to assess implications for animal and human health.

consulted its Ad Hoc Group on MERS-CoV Infections in Animals and the Ad Hoc Group on Camelid diseases to provide advice on the latest scientific information and to provide recommendations and guidance, including on priority research activities for the animal health sector.

The OIE is also working closely with its Member Countries to provide technical support and to encourage reporting of MERS-CoV detections in animals.

MERS-CoV is a great example of timely involvement by the OIE with emerging diseases of animals.