

Alkhurma Hemorrhagic Fever Virus

March 25th, 2009 FEVER Seasonality: Unknown. Seasonality not excluded (see figure 1). To date, available data are insufficient to document it.

Figure 1. Annual distribution of 11 AHFV infections in Saudi Arabia, 1994–1999 (Charrel, Zaki et al., 2005)



- Incubation period: Unknown. Probably similar to KFD, i.e. 3-8 days.
- **Clinic**: Acute febrile flulike illness with hepatitis (100%), hemorrhagic manifestations (55%), and encephalitis (20%). The potential existence of pauci-symptomatic and asymptomatic forms is unknown but probable.
- Lethality: 25-30% of reported cases.
- **Diagnostic:** PCR, viral culture and serology (possible cross reactions with other flaviviruses).
- **Treatment:** No specific therapy. The treatment is symptomatic.
- Vaccine: No vaccine. An inactivated vaccine against KFD virus is used in high KFD endemic areas in India. This vaccine is not accessible outside India and has not been tested against AHFV.

2. EPIDEMIOLOGY

2.1. Context

- Makkah and Najran provinces are located in Western Saudi Arabia, close to Eastern Africa (Map 1). Climatic conditions are warm and dry.
- Each year, during Hajj's period, a large number of livestock are imported to Makkah city, through Jeddah's seaport. Because of close contacts between people and cattle, this period is prone to animal-to-human infectious diseases transmission.

1



Transmission:

1. ALKHURMA

VIRUS (AHFV)

- 1. *Transcutaneous*, by contact with infected blood on a skin wound or by infective tick bite, which is probably under-estimated.
- 2. *Digestive*, by consumption of unpasteurised dairy products from infected animals.

To date, no human-to-human transmission has been reported (as for KFD).

Map 1. Makkah and Najran provinces

located on West coast of the country (Map 1).

HEMORRHAGIC

Isolated for the first time in 1994 in Alkhumra district

Genus: Flavivirus. Genetically very closely related to Kyasanur forest disease (KFD) virus, which circulates

Available data are in favour of ticks bite transmission: AHFV is genetically and serologically closely

 Tick bite has been associated with clinical cases.
 AHFV RNA was <u>recently detected</u> in ticks (*Ornithodoros savignyi*) collected on a camel

• O. savignyi were found where AHFV infected

The hypothesis that mosquitoes could also be vectors

was mentioned in a prospective survey performed in

Saudi Arabia. Although this hypothesis cannot be formally excluded, no data were provided to

Reservoir: Not documented. Probably sheep, camels,

Geographical distribution: Unknown. Reported only

in Saudi Arabia in Makkah and Najran provinces, both

(south of Jeddah), Makkah province, Saudi Arabia.

in India (Karnataka) and probably in China.

Vector: Ticks, (possible other vectors)

related to tick-borne flaviviruses.

resting place in Jeddah.

cases were reported.

substantiate it.

goats.

2.2. Epidemiological background

- In the absence of a specific AHFV surveillance system epidemiological data are scarce and provided by few studies.
- <u>Study 1</u>: From 1994 to 1999, 11 confirmed cases (all males) were reported by the Jeddah laboratory. Inclusion / non-inclusion criteria were not detailed. Among the 11 cases:
 - Six were Egyptian butchers; 5 had other occupations and origins (4 Saudi, 1 Eritrean).
 - ✓ Mode of transmission:
 - 6 had been contaminated by a skin wound (the 6 Egyptian butchers).
 - 2 reported tick bites.
 - 3 reported raw milk consumption.
 - ✓ Four died (CFR 36%): 2 among Egyptian butchers, 2 among others.
- <u>Study 2:</u> Following the identification of 4 AHFV infections in Makkah during 2001 Hajj's period (through a Rift Valley Fever surveillance), a prospective study was performed from February 8th 2001 to February 9th 2003 by Jeddah Medicine University. The survey reported:
 - 37 suspect cases identified among which 20 were biologically confirmed.
 - Geographic origin: 8 (40%) from Saudi Arabia, 5 (25%) from Bangladesh, 7 (35%) from other countries (Egypt: 2; Yemen: 2; Burma: 1; Ethiopia: 1; Pakistan: 1). No information regarding place of infection is available.
 - Occupation of cases: 10 (50%) labourers, 3 (15%) office employees, 3 (15%) students, only 1 butcher and 1 other occupations.
 - Mode of transmission:
 - All 20 confirmed cases were resident or had visited Makkah's districts that have livestock marketplaces or slaughterhouses.
 - Excluding the above potential exposure, 9 (45%) reported only mosquito bites, 3 (15%) direct contact with sheep or goats only, 5 (25%) were both exposed to mosquito bites and direct contact with sheep or goats.
 - None reported tick bite. However, it is known that tick bites are rarely noticed by patients.
 - None had drunk raw milk.
 - One patient had been in contact with a similar case (without precision). It is not specified if this patient had other exposure factors or not.
- To date and contrary to KFD, no increase in animal mortality due to AHFV has been reported before the occurrence of AHFV human cases.

2.3. Current event

- Since the beginning of 2009, 4 Alkhurma hemorrhagic fever cases have been reported in Najran province.
- 1 additional case was diagnosed in 2008 and is still hospitalised (no clinical improvement).
- Information about contacts with animals, ticks or mosquito bites is not available.
- Epidemiological investigations (human, entomological and veterinary) and vector control measures are ongoing. Narjan's health professionals (physicians, veterinaries...) received training on AHFV diagnosis and management.
- Before 2008, only one <u>case</u> had been reported in Najran (2005).

3. COMMENTS

- Alkhurma virus is an emerging tick-borne hemorrhagic fever agent, with a high Case Fatality Rate (25-30%). It is classed as level four biosafety pathogen by the CDC.
- To date, AHFV infections have only been detected in Saudi Arabia.
- There is a lack of epidemiological, veterinary and entomological data. Further studies are needed to characterise this pathology and its potential risks for public health. The cycle of transmission is also still poorly known.
- Three of the four viral hemorrhagic fevers identified in Saudi Arabia (AHFV, CCHF, and Dengue), used to be confined to Makkah province. The 4th one, RVF, has been diagnosed in the whole country.
- Although, AHFV has recently been isolated in Najran province, its circulation seems to remain limited to 2 provinces (Makkah and Najran). Nevertheless, in absence of active detection (seroprevalence survey), the circulation of the virus in other areas (inside or outside the country) cannot be excluded.
- Because of large livestock trade with neighbouring countries, the spread of AHFV to other countries cannot be excluded. Therefore, and taken into account the disease severity, the situation needs to be carefully monitored.