

SCHMALLEMBERG VIRUS - NETHERLANDS: RISK PROFILE

Risk Profile Human Schmallenberg virus

1. Situation assessment

On 18 Nov 2011, scientists from the Friedrich Loeffler institute in Germany identified the presence of viral sequences in serum from cattle affected by a specific febrile syndrome. The sequences show homology to the L, M, and S gene segments of viruses from the family Bunyaviridae, genus Orthobunyavirus. Full details of the virus characterization are needed before definitive conclusions can be drawn about the taxonomic assignment. However, based on the preliminary data, the virus -- named Schmallenberg virus -- is most related to genomic sequences of Shamonda-, Aino-, and Akabane-virus, all grouped within the Simbu serogroup and known as viruses that may cause illness in ruminants.

Based on the findings so far, the infection is considered to be the likely cause of a clinical syndrome that occurred in late summer in cattle (fever, decreased milk production, diarrhea) in Germany and the Netherlands, and more recently in sheep in The Netherlands (intra-uterine malformations). Evidence for association of the virus with the illness in cattle and sheep in the Netherlands comes from the detection of viral gene sequences by RT-PCR in a significant proportion of sera from cattle with the syndrome, while 150 sera from healthy cattle were negative. Furthermore, the virus was detected in brain material from lambs with congenital abnormalities.

So far, Schmallenberg virus has been identified in the North Rhine-Westphalia (Germany) and the Netherlands. Based on an initial assessment of the clinical syndrome in the Netherlands, the infection appears to be dispersed across the country with no apparent geographic clustering.

As the family Bunyaviridae contains several medically important viruses, a risk assessment was made to identify potential human health risks.

6. Clinical manifestation of orthobunyaviruses in human

Currently, Schmallenberg virus has not been related to human disease. Shamonda-, Aino-, and Akabane-virus, which are genetically most related to the Schmallenberg virus, are only found in livestock. However, the zoonotic potential of this virus cannot be excluded as:

- 1) Viruses within the Simbu serogroup (Oropouche virus and Iquitos virus) are known to be zoonotic and cause human outbreaks.
- 2) Genetic reassortment among members of the same serogroup within the Orthobunyavirus genus occurs in nature and has led to the emergence of new viruses, occasionally with increased pathogenicity. This may increase the zoonotic potential of these viruses, as reassortment might lead to change of host reservoirs.
- 3) Viruses within other serogroups of the genus orthobunya are zoonotic. Examples: California encephalitis virus, La Crosse encephalitis virus, Tahyna virus, Bataivirus, Inkoovirus, Snowshoe hare virus.

Oropouche virus, like Schmallenberg virus, is a member of the Simbu serogroup, causes a febrile disease often associated with headache, dizziness, photophobia, skin rash, myalgias, arthralgias and malaise, which may be long lasting and sometimes relapsing 2-3 weeks after initial onset of symptoms (18). Patients with Oropouche fever usually recover after 2-3 weeks of disease without known sequelae or recorded mortality. The very limited information available indicates that Oropouche virus infection is associated with viremia that declines quickly until the 5th or 6th days of illness and that the virus has been recovered from the cerebral spinal fluid (CSF) in association with clinical meningitis.

Iquitos virus, a member of the Simbu serogroup to which Schmallenberg virus belongs, causes illness that includes symptoms of fever, general malaise, headache, retro-orbital pain, myalgia, arthralgias and chills. Respiratory manifestations were observed in 38 percent of the cases and gastrointestinal manifestations in 75 percent of the cases, including diarrhea, vomiting, nausea.

There have been no reports of unusual human illness from the regions where Schmallenberg virus has been identified. The veterinary health service indicates that farmers from affected farms have been specifically

asked for symptoms of illness and have reported none.

9. Conclusion/recommendations.

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- 1) Based on the considerations mentioned above, zoonotic transmission of Schmallenberg-virus cannot be excluded but is considered unlikely.
 - 2) The clinical syndrome associated with Schmallenberg virus in cattle peaked during the months August and September 2011. Currently, the circulation/transmission of Schmallenberg virus in cattle seems to have faded out. The recent increase in delivery of malformed lambs -- if proven to be related to the infection -- is likely resulting from intra-uterine exposure during prior months.
 - 3) If one would assume that Schmallenberg virus has zoonotic potential, there is no acute risk for the human population at present (December 2011) when considering the vectorial transmission route (most likely midges). However, exposure risk during abortion or delivery of affected ruminants due to Schmallenberg virus is unknown.
 - 4) There have been no reports of unusual illness in humans in the months when the cattle syndrome peaked.
 - 5) The outbreak in cattle in Germany and the Netherlands could reoccur in the vector season in 2012 (based on epidemiology of other orthobunyaviruses and bluetongue virus, and survival in midges during winter). In this case, these outbreaks should be monitored closely from a public health perspective, and an increased awareness for putative zoonotic events is indicated, for instance by implementation of a surveillance system.
 - 6) We advise the initiation of a monitoring system for diseases among professionals (farmers, veterinarians) that have been in close contact with abortion products or who conducted deliveries of affected calves/lambs. They will be advised to contact the local municipal health services. The national center for control of infectious diseases (LCI) will coordinate this system.
 - 7) Currently, diagnostic methods for this virus are limited to RT-PCR and have not been validated. Improved diagnostic methods will be developed in the near future. The CIB is in contact with the FLI and CVI to prepare for laboratory response in case such is needed.

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