



Rijksinstituut voor Volksgezondheid
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JOINT RISK ASSESSMENT

New *Orthobunyavirus* isolated from infected cattle and small livestock – potential implications for human health

8 May 2012

This updated rapid risk assessment was prepared jointly with the Robert Koch Institute (RKI), Germany, and the National Institute of Public Health and the Environment (RIVM), Netherlands.

Main conclusions and recommendations

In November 2011, public health authorities in the EU Member States were alerted about the outbreak of Schmallenberg virus (SBV) in ruminants. Since then, animal and human health authorities, both at national and EU level, have been closely collaborating on this topic to ensure the rapid detection of changes in the epidemiology in animals and humans, particularly among people who had been in close contact with infected animals.

Epidemiological and microbiological studies conducted by the Robert Koch Institute (RKI) in Germany and the National Institute of Public Health and the Environment (RIVM) in the Netherlands have confirmed that the zoonotic potential of SBV is absent or very low. ECDC fully supports the assessments results delivered by RIVM and RKI, which both conclude that it is very unlikely that SBV poses a risk to humans.

As a general precaution, animal workers, farmers and veterinarians are advised to follow existing protective hygiene measures when working with livestock and abortion material.

Public health issue

The objective of this updated rapid risk assessment is to review:

- the current epidemiological situation in animals in the EU;
- the main findings on this new *Orthobunyavirus* in animals and in humans;
- the conclusions of studies which evaluate the potential public health impact of this virus.

Source of assessment request and experts consulted

Initial rapid risk assessment: internal ECDC decision taken at daily round table on 19 December 2011.

Update: internal decision on 2 May 2012.

The consulted experts were:

- Marion Koopmans, Chantal Reusken (National Institute for Public Health and the Environment (RIVM), Netherlands); and
- Lars Schaade, Hendrik Wilking (Robert Koch Institute (RKI), Germany).

Disease background information

Schmallenberg virus (SBV) is a novel orthobunyavirus that has been associated with disease in ruminants (cattle, sheep and goats) in Europe. Antibodies were also detected in individual roe deer, red deer and one bison [2].

The disease causes transient clinical symptoms in adult cattle (fever, diarrhoea, reduced milk yield, etc.) and congenital malformation in newborn ruminants.

Genetic analysis of the Schmallenberg virus genome shows that this virus is part of the Simbu serogroup of the *Bunyaviridae* family, genus *Orthobunyavirus*.

Observational studies revealed that the virus is transmitted via insect vectors, mainly midges. The virus has been identified in pools of heads of *Culicoides obsoletus* and *Culicoides dewulfi* [3–6]. Animal-to-animal transmission has been excluded at this stage.

A commercial ELISA kit for the detection of anti-Schmallenberg virus antibodies in ruminant serum and plasma is available.

Event background information

Animal health: Schmallenberg virus isolated from ruminants in the European Union

Since November 2011, Schmallenberg virus has been reported in cattle, sheep and goats in eight EU Member States: Belgium, Germany, France, Italy, Luxemburg, the Netherlands, Spain, and the United Kingdom.

As midges are believed to be the major route of transmission [7], significant spread is unlikely during the winter period when these insects are usually inactive. Vector activity is expected to start again by the end of April.

Upon request of the European Commission, the European Food Safety Authority (EFSA) provided in February a preliminary analysis of the likely epidemiological scenarios [8] that could be observed in animals in Europe. This analysis was based on the existing knowledge of viruses of the Simbu virus serogroup and other vector-borne epizootics (e.g. BTV8) in Europe. The hypothetical scenarios show that, depending on the temperature and the number of vectors, SBV might spread further in susceptible animal populations. Whenever the number of vectors per host and the temperatures are above a specific threshold there is a possibility of further spread to additional Member States.

In order to assess the extent of the outbreak in the EU, EFSA collected epidemiological data, at herd/flock level and animal level, from affected Member States. The collected data covered the period from 1 August 2011 to 16 April 2012, updating the previously published report on the epidemiological situation of SBV. Results of the analysis of the data collected were presented in two technical reports ('Schmallenberg' virus: analysis of the epidemiological data [9, 10]), published on 2 April and 4 May. The total number of SBV-confirmed herds in Europe as of 16 April 2012 is 3444. So far this year, no confirmed acute cases have been reported in adult animals. After a peak in week 9 (27 February–4 March 2012), the number of reported SBV-confirmed herds decreased. This decrease is clearly observed in sheep, both in numbers of confirmed and suspected herds. However, no such clear decrease is observed in cattle. The decrease in number of confirmed herds is most probably linked to the end of the lambing season in affected countries. Maps representing the spatial distribution of cases are available in the reports.

Studies to assess the implications for human health

In order to assess the potential impact of this epizootic on public health, both RKI and RIVM have completed the following studies.

Study by Robert Koch-Institute, Germany [11, 12]

In a cross-sectional seroprevalence study, the RKI tested shepherds living in the epidemic area in Germany (North-Rhine Westphalia) for the presence of SBV antibodies. At an informational SBV meeting of shepherds, 60 participants were recruited for the study (after informed consent had been obtained). They were interviewed for their patterns of contact to SBV-infected livestock and a blood sample was collected from each person. The majority of the participants had been significantly exposed by repeated direct contact to SBV-infected sheep and

birth materials known to contain high virus loads. From the interviews, no evidence for an increased frequency of unusual clinical symptoms was found.

The RKI developed an immunofluorescence antibody test (IFAT) and a neutralisation test (NT) for the detection of specific antibodies against SBV in humans. All blood specimen tested negative for specific antibodies against SBV. In order to detect SBV-specific RNA, RKI performed real-time RT-PCR on all sera, which all tested negative.

Study by the National Institute of Public Health and the Environment, Netherlands [13, 14]

Three hundred and one persons were tested for antibodies to SBV by virus neutralisation test. The study population consisted of 234 persons working or living on SBV-infected farms, and 67 veterinarians, all with known exposure to SBV-infected herds. Of these, 229 persons had direct exposure to newborn calves, lambs, and/or birthing materials from SBV-infected herds, and 150 persons reported exposure to biting insects. All sera tested negative, whereas high levels of antibody were found in serum from an infected animal that was used as a control.

More information available at:

<http://www.rivm.nl/dsresource?objectid=rivmp:120203&type=org&disposition=inline>

ECDC threat assessment for the EU

The results of the RKI and RIVM studies confirmed the preliminary assessment formulated by ECDC and RIVM [1, 15].

ECDC fully supports the assessment results delivered by RIVM and RKI, which both conclude that the risk of infection of individuals exposed to SBV is absent or extremely low and that it is very unlikely that SBV poses a risk to humans.

These assessment results are based on the following observations:

- The genetically most closely related viruses (Shamonda, Aino, and Akabane viruses) have never been associated with disease in humans.
- People who have been in close contact with infected animals (e.g. animal workers, farmers, and veterinarians) have not reported any unusual disease.
- There is no evidence of any sero-conversion in people who presumably have been exposed to the virus.

Conclusions

In November 2011, public health authorities in the EU Member States were alerted about the outbreak of Schmallenberg virus (SBV) in ruminants. Since then, animal and human health authorities, both at national and EU level, have been closely collaborating on this topic to ensure the rapid detection of changes in the epidemiology in animals and humans, particularly among people who had been in close contact with infected animals.

Epidemiological and microbiological studies conducted by the Robert Koch Institute (RKI) in Germany and the National Institute of Public Health and the Environment (RIVM) in the Netherlands have confirmed that the zoonotic potential of SBV is absent or very low. ECDC fully supports the assessments results delivered by RIVM and RKI, which both conclude that it is very unlikely that SBV poses a risk to humans.

As a general precaution, animal workers, farmers and veterinarians are advised to follow existing protective hygiene measures when working with livestock and abortion material.

Contact

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