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Guidance

Severe fever with thrombocytopaenia syndrome (SFTS): epidemiology, outbreaks and guidance

The epidemiology, symptoms, diagnosis and management of severe fever with thrombocytopaenia syndrome (SFTS).

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Epidemiology

Severe fever with thrombocytopaenia syndrome (SFTS) is caused by the SFTS virus (SFTSV), also known as Huaiyangshan banyangvirus, in the order Bunyavirales (bunyavirus), genus phlebovirus.

SFTSV was isolated from human blood (https://www.nejm.org/doi/pdf/10.1056/NEJMoa1010095) for the first time in 2009. There is a Chinese lineage of SFTSV containing 6 sub-lineages, and a Japanese lineage containing 4 sub-lineages.

SFTS is a tick-borne zoonosis, but human-to-human transmission (https://www.sciencedirect.com/science/article/pii/S1198743X14000688) can also occur. Most infections occur in rural areas in at-risk countries, where there is an increased presence of ticks.

Human cases were first identified in Central and Eastern China and further cases have been identified in Western Japan (https://wwwnc.cdc.gov/eid/article/26/4/19-1011_article), South Korea (https://journals.plos.org/plosntds/article?id=10.1371/journal.pntd.0005264), and Taiwan (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7323535/).

Additionally, SFTSV has been detected retrospectively in stored blood samples from patients with thrombocytopaenia in Vietnam (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6478219/), and there are reports of serological evidence of SFTS infection in Pakistan (https://wwwnc.cdc.gov/eid/article/26/7/19-0611_article#tnF1).

From 2010 to 2019, a total of 13,824 SFTS cases (8,899 lab-confirmed and 4,925 probable cases) were reported in mainland China (https://www.mdpi.com/1660-4601/18/6/3092/htm), including 713 deaths (average annual fatality rate of 5.2% nationally).

Seroprevalence studies (https://pubmed.ncbi.nlm.nih.gov/27117875/) have estimated that 4.7% of populations in endemic areas of China have antibodies against SFTSV. Lower numbers of cases have been reported by Japan and South Korea.

Cases tend to peak between May and July in China, May and October in South Korea, and April and August in Japan. Case fatality rates have varied between reporting countries from 5.2% in China to 32.6% in the South Korea.

Transmission

Human infections usually occur as the result of being bitten by a tick carrying SFTSV. Several types of tick can be infected with SFTSV, but the Asian long-horned tick, Haemaphysalis longicornis, is most frequently identified with carriage of SFTSV and transmission of infection to humans.

Sheep (https://wwwnc.cdc.gov/eid/article/19/5/12-0245_article), goats (https://wwwnc.cdc.gov/eid/article/18/6/11-1345_article) and other mammals may serve as intermediate hosts.

Many different animals may be infected naturally, including rodents, small mammals and yaks.

Humans are accidental hosts when bitten by ticks.

Haemaphysalis longicornis is found in several Asian countries. It is also found Australia, New Zealand, islands in the Western Pacific region, and the USA. However, to date, there are no reports of SFTSV having been detected in ticks in these countries.

The precise modes of human-to-human transmission SFTSV transmission are unclear, although it appears to require close contact with an infected individual, their blood or other bodily fluids, or their immediate environment.

Nosocomial transmission is reported to have occurred in emergency departments and intensive care units in China and South Korea. Transmission via percutaneous exposure (for example, needle-stick injury) has also been reported.

The possibility of transmission via aerosol-generating procedures, without the use of sufficient respiratory protective equipment, was proposed in an epidemiological study of one small cluster.

Clinical features

As the name suggests, the key features of SFTS are high fever and a low platelet count. The illness begins with a non-specific, viraemic prodrome, which is often flu-like and associated with fever.

Gastrointestinal disturbances may also be present, including abdominal pain, vomiting and diarrhoea. The prodrome lasts for around 7 days.

The incubation period is 7 to 14 days, typically around 9 days. There appears to be a spectrum of disease, with some patients only having a mild illness, which resolves spontaneously.

In those who have progressive disease, severe illness typically develops in the second week. Reported complications include acute kidney injury, myocarditis, haemorrhage (including disseminated intravascular haemorrhage), meningioencephalitis, haemophagocytic lymphohistiocytosis, and multi-organ dysfunction.

In those who survive severe illness, signs of recovery usually emerge around days 8 to 11 of illness, accompanied by a decrease in blood viral load and recovery of the platelet count.

In fatal cases, high-level viraemia and thrombocytopaenia persist or worsen; often associated with increasing blood levels of alanine aminotransferase (ALT) and aspartate aminotransferase (AST).

Patient assessment

SFTS is classed as a contact high consequence infectious disease (HCID) (https://www.gov.uk/guidance/high-consequence-infectious-diseases-hcid) in England and clinical assessment should be performed by specialist hospital staff, with adherence to strict infection prevention and control precautions (see below) to prevent secondary transmission.

Follow the Advisory Committee for Dangerous Pathogens (ACDP) guidance for managing contact HCIDs (https://www.gov.uk/government/publications/viral-haemorrhagic-fever-algorithm-and-guidance-on-management-of-patients).

Consider SFTS in a patient with a relevant travel or exposure history who presents with a compatible illness, particularly fever and thrombocytopaenia, with illness onset within 14 days of a potential exposure.

Any suspected cases in England should be discussed with local infection specialists and with the Imported Fever Service (IFS) (https://www.gov.uk/guidance/imported-fever-service-ifs) (24 hour telephone service: 0844 778 8990).

The IFS can advise on whether laboratory testing is indicated. The IFS is also available to clinicians in Scotland, Wales and Northern Ireland.

All suspected cases of SFTS should be notified immediately to the nearest PHE Health Protection Team.

Along with consideration of other travel-associated and common infections in the differential diagnosis, clinicians should also consider other, more common tick-borne infections relevant to the area visited, such as rickettsioses.

Laboratory diagnosis

In the UK, the Rare and Imported Pathogens Laboratory (RIPL) (https://www.gov.uk/government/collections/rare-and-imported-pathogens-laboratory-ripl) at PHE Porton Down is the designated diagnostic laboratory.

The mainstay of SFTSV detection at RIPL is reverse transcription polymerase chain reaction (RT-PCR). Serology for STFSV antibodies is not available.

Any suspected case should be discussed with local infection specialists and with the IFS, as above. The IFS can advise on whether laboratory testing is indicated, and if so, will provide advice about the sample types required.

IFS will also advise on sample collection precautions and transport requirements. Information on safe collection and handling of biological samples is available in the abovementioned ACDP guidance on managing contact HCIDs.

Treatment

Clinical management of confirmed SFTS cases in the UK must be provided by specialist infectious disease and critical care teams at a High Level Isolation Unit for Contact HCIDs.

Please refer to the ACDP guidance on the management of contact HCIDs for further details.

There is no proven, specific treatment for SFTS, and there is no preventative vaccine. Treatment is predominantly supportive, including use of blood products to manage haemorrhagic complications.

Ribavirin has been administered to patients with SFTS, but there is no conclusive evidence of therapeutic effect. Experimental treatments have been proposed, including favipiravir therapy.

Infection prevention and control

Prevention of transmission by contact routes is required. Since SFTS is a contact HCID, strict infection prevention and control (IPC) measures are required when caring for both suspected and confirmed patients.

Follow the ACDP guidance on the management of contact HCIDs.

When assessing and providing care to a hospital patient with suspected SFTS, enhanced personal protective equipment (PPE) must be used.

Advice for travellers to endemic areas

SFTS cases have occurred in Central and Eastern China, Western Japan, and rural areas of the Republic of Korea. Travellers who are hiking or doing other outdoor activities may be at increased risk of tick bites. Refer to advice for travellers about how to avoid tick bites (https://travelhealthpro.org.uk/factsheet/38/insect-and-tick-bite-avoidance).

The Travelhealthpro website (https://travelhealthpro.org.uk/) has information about current outbreaks and travel advice.

UK risk assessment

SFTSV is not found in the UK. Travel-associated cases of SFTS have not been reported to date, but they could occur in the future.

The risk of travel-associated cases in the UK is very low.

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