



Streptococcus suis Outbreak, Swine and Human, China



Emerging Disease Notice

August 2005

Summary

An outbreak of *Streptococcus suis* in swine and humans in the People's Republic of China was reported by the Chinese authorities. The outbreak began in late June, and as of the first week of August, there were 641 cases in pigs with 219 deaths, and 206 cases in humans with 38 deaths. *S. suis* is a zoonotic disease caused by a gram positive bacteria which is endemic in most pig rearing countries of the world. In swine, *S. suis* infection can be asymptomatic or cause an acute disease resulting in meningitis, septicemia, pneumonia, arthritis, and endocarditis and/or myocarditis. Human infections with *S. suis* can result in meningitis, septicemia, permanent hearing loss (in 50% of cases), pneumonia, endocarditis, arthritis, and toxic shock syndrome. Transmission among swine occurs through the air and through direct contact with secretions and blood of infected pigs. Piglets can be infected during birth. Transmission to humans occurs when skin wounds, or possibly mucous membranes, are contaminated by the blood or secretions of infected pigs. Farmers, veterinary personnel, and slaughter workers are at increased risk for infection. This outbreak of *S. suis* is atypical for the apparent large number of human cases, high human fatality rate and geographical spread.

Background

On August 5, 2005 the Director of the Ministry of Agriculture, People's Republic of China ,

The prefectures in Sichuan where *Streptococcus suis* cases reported
(as of 5 Aug 2005)





***The cases included suspected, clinically diagnosed and laboratory confirmed cases**

reported an outbreak of *Streptococcus suis* B infection in pigs to the OIE. The outbreak was first recognized on June 25, 2005 in the prefecture of Ziyang, Sichuan province, and has reportedly spread to 7 other prefectures in Sichuan. Human cases of *S. suis* have been reported in all 8 of the prefectures with swine cases, and in 2 additional prefectures (see map). In 2000, 83.3 million people lived in Sichuan province, and over 10 million in the capital city of Chengdu. Sichuan province is the largest producer of pork in China .

Map source WHO <http://www.wpro.who.int/NR/rdonlyres/730601F9-A94B-4B90-A849-A338CA9DCDAC/0/sichuanoutbreakasofaug8.jpg>

The number of affected swine premises was not specified in the report to the OIE, although all were backyard farms. As of the report date, there was a total of 6736 susceptible pigs, with 641 cases and 319 deaths (case fatality = 50%). A description of clinical signs in the affected pigs was not provided in the report. Diagnostic testing included isolation, culture, microscopy, fluorescent antibody test, polymerase chain reaction (PCR), and sequencing. Diagnostic tests to rule out avian influenza and Nipah virus were conducted with negative results.

An associated outbreak of *S. suis* infection in humans was officially reported to the World Health Organization by China's Ministry of Health on July 22, 2005. The first human cases occurred in late June in the city of Ziyang. As of August 3, a total of 206 cases and 38 deaths (case fatality = 18%) have been reported. A news report dated August 8 stated that the number of cases had increased to 214, of which 44 (21%) have been laboratory diagnosed. Two cases have been reported in Guandong province; the remainder occurred in 11 prefectures in Sichuan province. Symptoms in human cases included high fever, malaise, nausea, vomiting, meningitis, subcutaneous hemorrhage, toxic shock, and coma. The affected population consists primarily of adult male farmers. No evidence of human-to-human transmission has been found.

Clinical Presentation and Epidemiology

S. suis is a gram positive bacteria which is endemic in most pig rearing countries of the world. There are 20 serogroups and at least 35 serotypes, with clinical disease in swine usually associated with types 1 and 2. *S. suis* type 1 occurs mostly in piglets less than 8 weeks of age, causing arthritis (swollen joints) and meningitis (head tilt, paddling, convulsions). *S. suis* type 2 affects pigs up to market weight, causing an acute disease resulting in meningitis, septicemia, pneumonia, endocarditis and/or myocarditis and death. Additionally, clinical signs may include red skin, enlarged lymph nodes, abortion, genital tract disease, and arthritis. Both types can cause asymptomatic infection and the bacteria may be carried in the tonsils, upper respiratory tract, and vaginal canal for long periods of time. Stress due to poor housing conditions, such as crowding and inadequate ventilation, are risk factors for the development of clinically apparent disease. Transmission occurs through the air and through direct contact with secretions and blood of infected pigs. Piglets can be infected during birth. Environmental contamination may play a role in transmission since the organism can survive long periods in feces, dust, carcasses, and flies.

Human infections with *S. suis* can result in meningitis, septicemia, permanent hearing loss (in 50% of cases), pneumonia,

endocarditis, and arthritis. Mortality has been 7% in reported human cases. Toxic shock syndrome may also occur, leading to multiple organ failure. Transmission to humans usually occurs when skin wounds, or possibly mucous membranes, are contaminated by the blood or secretions of infected pigs. Farmers, veterinary workers, and slaughter workers, therefore, are at increased risk for infection. The incubation period is short, ranging from a few hours to three days. Cases usually occur sporadically, with approximately 80 human cases reported in the Netherlands and other countries from 1968-1985; although the disease in humans is probably underdiagnosed and underreported in most countries.

Interpretation

The current outbreak of *S. suis* is atypical for the apparent large number of human cases, high human fatality rate and geographical spread. Epidemiologic and microbiologic investigations of both the swine and human outbreaks are needed to accurately describe the extent of the outbreak and potential risk factors. Conditions that may be contributing to the outbreak include poverty, unsanitary slaughter practices and improper carcass disposal.

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