

***Streptococcus suis* IN A SWINE FARM WORKER: FIRST ISOLATION IN BRAZIL**

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ABSTRACT

Streptococcus suis represents a potential zoonosis risk in personnel working in close contact with swines. The purpose of this study was to evidence the human carrier status of *S. suis* in farm workers belonging to three different pig farms located in three different cities of the state of São Paulo, Brazil. Cotton swab samples were taken from tonsils of 28 workers. The *S. suis*-like strains were identified by polymerase chain reaction, confirmed by sequencing and serotyped by coagglutination technique. For the first time in Brazil, one farm worker was identified as a human carrier of *S. suis*.

Keywords: *Streptococcus suis*, human beings, pig farm workers, Brazil.

Streptococcus suis* EM FUNCIONÁRIO DE GRANJA SUINÍCOLA: PRIMEIRO ISOLAMENTO NO BRASIL*RESUMO**

Streptococcus suis representa um potencial risco zoonótico para indivíduos que trabalham em contato íntimo com suínos. O objetivo deste estudo foi evidenciar o estado de portador de *S. suis* em funcionários de granjas provenientes de três diferentes granjas suinícolas localizadas em três diferentes cidades do estado de São Paulo, Brasil. Foram coletadas amostras de tonsilas de 28 funcionários. As linhagens suspeitas de *S. suis* foram identificadas por PCR, confirmadas por sequenciamento e sorotipificadas pela técnica de coaglutinação. Pela primeira vez no Brasil, um funcionário de granja foi identificado como portador de *S. suis*.

Palavras-chave: *Streptococcus suis*, seres humanos, funcionários de granjas suinícolas, Brasil.

Streptococcus suis* EN UN EMPLEADO DE GRANJA DE CERDOS: PRIMER AISLAMIENTO EN BRASIL*RESUMEN**

Streptococcus suis es un potencial riesgo de zoonosis para las personas que trabajan en contacto directo con cerdos. El propósito de este estudio fue detectar el estado de portador de *S. suis* en trabajadores de tres diferentes granjas porcinas ubicadas en tres ciudades diferentes en el estado de São Paulo, Brasil. Se recogieron muestras de amígdalas de 28 empleados. Las cepas sospechosas de *S. suis* fueron identificadas por PCR, confirmadas por secuenciación y serotipificadas mediante la técnica de coaglutinación. Esta es la primera vez en Brasil en que un empleado fue identificado como un portador de *S. suis*.

Palabras clave: *Streptococcus suis*, seres humanos, trabajadores de granjas de cerdos, Brasil.

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Infections caused by *Streptococcus suis* are considered a worldwide problem in the swine industry, causing septicemia, meningitis, endocarditis, arthritis, among others. *S. suis* is also an important zoonotic agent. In fact, it has been reported to be the first and the second frequent cause of bacterial meningitis in adults in Vietnam and Thailand, respectively (1, 2). Over the past few years, the number of human *S. suis* cases reported in the literature has increased significantly, especially after an outbreak occurred in China that involved 215 cases and 38 deaths, emphasizing the importance of *S. suis* as an emerging zoonosis. (1, 3). From the 35 capsular serotypes currently known, serotype 2 is considered the type most virulent and frequently isolated from both swine and humans. However, serotypes 1, 4, 5, 14, 16 and 24 have also been isolated from clinical cases in humans (4-7). In addition to meningitis, *S. Suis* can cause peritonitis, endocarditis, septic shock and many other infectious diseases in humans (3).

Although it is well known that pigs usually carry *S. suis* asymptotically, the condition of asymptomatic carrier in human is poorly unknown. Few epidemiological studies were performed in order to establish the prevalence of *S. suis* in individuals belonging to the main risk groups. The findings indicate that *S. suis* carriage may occur in individuals with prolonged and recurrent exposure to pigs and pork (8, 9). In Brazil, since 1981 until now, there are only about 15 published scientific papers about this pathogen, recovered mainly from diseased animals. The present study is the first that aims to verify the occurrence of *S. suis* in healthy humans working in close contact with pigs.

Twenty-eight healthy employees belonging to three different pig farms located in three different cities of the state of São Paulo were sampled. The materials from tonsil swabs were aseptically transferred to the surface of a 5% sheep blood agar plate. The plates were incubated aerobically at 37°C and inspected for growth after 24 and 48 hours. Ten colonies 1-2 mm in diameter showing alpha-hemolysis were suspected as potential *S. suis* (10). The *S. suis*-like strains were identified by polymerase chain reaction (PCR) for *gpd* gene (11). DNA extraction was conducted using the Chelex-100 resin following instructions from the manufacturer (Bio-Rad Laboratories, CA, USA). The antimicrobial susceptibility of the *S. suis* strain was determined by disc diffusion method using Müeller-Hinton agar supplemented with 5% defibrinated sheep blood, according to the recommendation reported by CLSI (12).

S. suis was detected from the tonsils of one of the 28 workers sampled. The PCR positive strain was confirmed to be *S. suis* by 16S sequencing (13). The strain could not be serotyped by coagglutination technique using sera against the 34 described serotypes and thus considered “untypable” (14). The isolate was classified as being sensitive to the following antibiotics: ampicillin, amoxicillin-clavulanate, ceftiofur, doxycycline, enrofloxacin, levofloxacin and norfloxacin and resistant to azithromycin, cephalixin, clindamycin, erythromycin, florfenicol, trimethoprim-sulfa and tetracycline. Finally, the sensitivity was classified as intermediate to penicillin, chloramphenicol and ciprofloxacin.

Carriers are individuals who harbor a potentially virulent infectious agent without showing clinical signs. Usually, isolation and identification of the agent are needed to confirm the carrier status. For this purpose, in farm workers, only one study had been previously conducted involving 25 individuals (15). This study did not evidence any positive result and no human carrier could be identified. However, human carrier status has already been demonstrated in slaughterhouse workers (8, 9).

Although the study has been conducted with a small number of individuals, we were able to demonstrate the carrier status in a Brazilian farm worker. This result may indicate the possibility of higher rates of carriers in this and other risk groups, such as slaughterhouse workers. The individual from whom the strain of *S. suis* was isolated was considered an asymptomatic carrier. Furthermore, the untypable strain may be either a non encapsulated strain that belongs to a known serotype and lost the ability to express capsule as previously

shown (16) or an encapsulated not yet described serotype. The possibility that clinical manifestations occur in the individual from whom this strain was recovered if his immunity is compromised cannot be ruled out. It is possible that this disease is under diagnosed in Brazil, a country with a population of 38 millions of pigs and 400,000 people working within the swine sector.

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