

**CASE REPORT**

## Acute meningitis by *Streptococcus suis*

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### ABSTRACT

*Streptococcus suis* is a coccus Gram positive, anaerobic optional. Human infection by this microorganism is a zoonotic disease that usually presents as purulent meningitis. Mortality is low but is common sequelae. A case of meningitis by *S. suis* secondary to contact with pigs is presented here. A 35-year-old male patient was admitted to the hospital complaining of high fever, malaise, vomiting and headache. A physical examination revealed decreased level of consciousness, with adequate response to painful stimulus and his eyes with deconjugated gaze. *S. suis* was isolated in blood culture. He was treated with cefotaxime, vancomycin and acyclovir in the intensive care unit. He experienced progressive improvement. He was discharged with severe deafness and a minimally unstable gait as sequelae. *J Microbiol Infect Dis* 2012; 2(4): 160-162

**Key words:** *Streptococcus suis*, meningitis, deafness.

## Akut *Streptococcus suis* menenjit

### ÖZET

*Streptococcus suis* fakültatif anaerop Gram pozitif bir koktur. Bu mikroorganizmanın insanlarda yaptığı enfeksiyonlar genellikle zoonotik hastalık şeklindedir ve pürülan menenjit olarak görülür. Mortalite düşük, sekel sıktır. Otuz beş yaşında bir erkek hasta yüksek ateş, kırgınlık, kusma ve baş ağrısı şikayetleri ile hastaneye başvurdu. Fizik muayenede şuur bulanıklığı, ağrılı uyaranlara cevap verme, göz hareketlerinde koordinasyon kaybı ve sabit bakış tespit edildi. Kan kültüründen *S. suis* izole edildi. Hasta yoğun bakımda sefotaksim, vankomisin ve asiklovir ile tedavi edildi. Progresif iyileşme gösterdi. Ciddi duyma kaybı ve minimal yürüme bozukluğu ile taburcu edildi.

**Anahtar kelimeler:** *Streptococcus suis*, menenjit, sağırılık

### INTRODUCTION

The infection by *Streptococcus suis* is a zoonosis with an occupational hazard, especially in subjects who are in contact with pigs.<sup>1</sup> *S. suis* is a gram-positive coccus that colonizes the respiratory, digestive and genital tracts of porcine livestock.<sup>2</sup> For reasons that are yet unknown, colonized adult animals do not usually show any clinical signs of involvement. The offspring are infected by direct contact with female carriers, or by contamination from the environment.<sup>3</sup> In 1968, the first cases of *S. suis* infection in humans were reported.<sup>4</sup> Since then, around 200 cases have been published in literature, most coming from places where porcine livestock is raised and its

derivatives are manufactured; these are mostly in countries in northern Europe, Hong Kong, Singapore and other zones in the Far East.<sup>1,5</sup>

In most of the people who are infected, there has been recent contact with porcine livestock or with their raw derivatives. The most frequent clinical manifestation is acute meningitis.<sup>6</sup>

### CASE REPORT

A 35-year-old male patient, farmer, with a history of febrile seizures in childhood, heavy smoker and occasional consumer of cocaine and alcohol. A few days before his admission, he presented with malaise, vomiting, diarrhoea, headache, weak-

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ness and fever. He was brought to urgent care after he was found lying on the floor with a relaxed bladder sphincter. Subsequently, he presented with generalized tonic-clonic movements in upper limbs. On his arrival to urgent care, he presented with a blood pressure of 120/94 mmHg, a temperature of 38°C and a Glasgow Coma Scale score of 7/15, with crackle while breathing. On his physical examination, as a response to painful stimuli, he opened his eyes with deconjugated gaze and infraversion of the right eye. In urgent care he experienced a new tonic-clonic seizure with a subsequent psychomotor agitation. There are no other relevant data in the rest of the physical examination. In his blood tests, he presented with leukocytosis of 17,000 cell/mL with 85% neutrophils and 50,000 cell/mL platelets, which is why a lumbar puncture could not be carried out at the time. Upon the suspicion of meningoencephalitis, he was admitted to the intensive care unit, and treatment was started with broad-spectrum antibiotics: cefotaxime, vancomycin and acyclovir, with which he experienced progressive improvement. A few days later, the department of Microbiology reported the isolation of an alpha-haemolytic streptococcus in blood, identified as *S. suis*. The result of the antibiogram showed sensitivity to penicillin, vancomycin, cefuroxime, cefotaxime, erythromycin and levofloxacin. After the platelets normalized, six days after the antibiotic treatment was started, a lumbar puncture was carried out, producing a cerebro spinal fluid (CSF) with a clear aspect, 110 leukocytes mm<sup>3</sup> (95% lymphocytes) with normal glucose and proteins. He is transferred to the neurology ward, presenting with a good level of conscience, tinnitus, hypoacusis and dizziness without moving objects, associated to an unstable gait, with an increased base of support. He was assessed by otorhinolaryngology (ORL), where postmeningeal sensorineural hypoacusis and deafness were observed. The study was completed with a brain magnetic resonance imaging (MRI) in which the uptake of contrast medium in the right cranial nerve VIII was seen at the intracanalicular level. Considering his improvement, he was discharged after completing a cycle of antibiotic therapy with penicillin; as a sequel to, he presented with severe deafness and a minimally unstable gait.

The possibility of a cochlear implant was considered by ORL. After ruling out the existence of signs of cochlear ossification, the cochlear

electrodes were completely inserted (Figure 1). The subsequent course of the patient has been adequate.



**Figure 1.** Cochlear electrode insertion by using radioscopy

## DISCUSSION

Infection by *S. suis* in humans is accidental and infrequent. It mainly produces meningitis associated to hypoacusis and ataxia.<sup>7</sup> In other cases, the infection can cause pneumonia, arthritis, diarrhoea, endophthalmitis, spondylodiscitis, bacteraemia, endocarditis, purpura fulminans, mycotic aneurisms and even rhabdomyolysis.<sup>7-10</sup> Other neurological sequelae are exceptional, and cases of persistent diplopia without ophthalmoparesis and facial paralysis have been described in literature.

*S. suis* is a gram positive, facultative aerobic germ that is frequently found as a saprophyte in pigs, where it causes multiple infections.<sup>11</sup> According to the antigenic composition of its cell wall, *S. suis* agglutinates with antiserum of the Lancefield R, S or T groups. Human infection is caused by type 2, and it predominates in males with occupational exposure to pigs. Most cases appear in immunocompetent patients.<sup>5</sup>

The pathogen's route of access can be cutaneous (by lacerations in the skin), respiratory or digestive. Even if the mortality by meningitis is low, (7-9%) lower than in other adult bacterial meningitis, auditive sequelae can appear in 40-

60% of the cases, and serious hypoacusis and vestibular lesion persist. Meningitis can affect the auditory system by different -albeit not excluding-mechanisms.<sup>11</sup> Perception hypoacusis could be associated to suppurativa labyrinthitis.<sup>1</sup> Although the incidence of meningitis by this microorganism remains low, this pathogen must be considered in the differential diagnosis of patients exposed to porcine livestock or its raw derivatives, as early treatment is essential for avoiding sequelae.<sup>1</sup>

Although it is considered that infections by *S. suis* are of an occupational nature, in many cases contact with pigs cannot be established, and consequently, the aetiological diagnosis is difficult. This zoonosis usually appears in immunocompetent people who come in contact with infected pigs or their products, although there are descriptions of cases in literature where it affects immunocompromised individuals, especially splenectomized subjects.<sup>3</sup>

As for surgical treatment, with the placement of a cochlear implant, in principle, what is most important for cases of meningitis is the risk of cochlear ossification (it happens in 40-70% of the cases after a bacterial meningitis, according to the different authors, and it is more frequent in cases of infection by *Streptococcus pneumoniae*).<sup>12</sup> And this is what brings about the urgent nature in the placement of implants. In the preoperative imaging tests computerized tomography (CT) and MRI, no signs of cochlear ossification were observed. In surgery, there are three ways of ensuring that the insertion has been correct: the first is the nonresistance to electrode insertion through cochleostomy, the second is Neural Response Imaging (NRI) and the third is radioscopy.<sup>13</sup> NRI is a method that allows measuring cochlear impedance and the responses of the auditory nerve through cochlear stimulation, once the electrodes have been inserted. In our case, these values were normal, which indicates the correct insertion of the electrode and the indemnity of the cochlea.<sup>13</sup>

We point out the importance of history taking to alert about the suspicion of the existence of this agent, mainly in meningitis and bacteraemia; because, even if it may not have any therapeutic

implication, it is of great epidemiological importance due to the increase in different countries of documented cases associated to raising or manipulating porcine livestock.<sup>14</sup> The rarity of the meningitis caused by *S. suis* should not make us forget about the importance of recording the occupational hazard in the medical history.<sup>15</sup>

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