

Bilateral Sensorineural Hearing Loss and Septic Arthritis in *Streptococcus suis* Meningitis Patient: A Case Report

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ABSTRACT

Background/aim: Bacterial meningitis is inflammation of the lining of the brain due to bacterial invasion of the CNS, especially in the cerebrospinal fluid in the subarachnoid and ventricles. Transmission of *S. suis* to humans occurs through direct contact with pigs and their processed products and consuming raw pork products. This case report reports a case of meningitis *S. Suis* with symptoms of decreased consciousness, bilateral sensorineural deafness and arthritis.

Case: with a gradual loss of consciousness accompanied by headache and fever. The patient works in a pig slaughterhouse, and often consumes processed pork. The patient has decreased consciousness, fever, stiff neck, headache and septic arthritis. The patient found *S.Suis* type I in the blood, joint fluid culture (+), and CSF culture (+). The patient was treated with ceftriaxone according to CSF sensitivity culture test, dexamethasone and antipyretic/analgesic as adjuvants. Patient recovered with improved genu arthritis and bilateral sensorineural hearing loss.

Conclusion: Transmission of *S. suis* to humans occurs through direct contact with pork and its raw processed products. Clinical manifestations such as headache, fever, nausea and vomiting accompanied by signs of meningeal stimulation. The most prominent and frequently reported symptom is hearing loss. Definitive diagnosis is highly dependent on clinical examination, CSF culture and blood culture. Antibiotic therapy for 14 days, corticosteroids are the treatment of choice in bacterial meningitis. A frequently reported complication with sensorineural loss.

Death is frequently reported in cases with systemic infection.

Keywords: Bacterial meningitis, *Streptococcus Suis*, sensorineural hearing loss, arthritis septic, infected pigs and pork products

INTRODUCTION

Streptococcus suis infection has been reported in many countries in Southeast Asia, such as Thailand and Vietnam, where the population has home-based pig farms and the habit of consuming raw pork. [3,4] Clinical manifestations of *S. suis* infection are meningitis, septic arthritis, sepsis, endocarditis, and endophthalmitis. Sequelae of hearing loss and loss of vestibular function are common in patients with meningitis due to *S. suis* infection.[1]

Culture of blood and/or cerebrospinal fluid is the gold standard diagnostic test performed to diagnose *S. suis* infection.[2] The therapy of choice most often used for *S. suis* infection is ceftriaxone and penicillin as monotherapy.[3] In this case report, we report *S. suis* infection with clinical manifestations of decreased consciousness, bilateral sensory hearing loss and septic arthritis.

CASE REPORT

A 43-year-old man with a gradual decrease in consciousness since 2 days ago that occurred slowly. At first it was said to be disconnected when spoken to and when

the patient was seen in the ER, the patient was raging. This complaint is accompanied by the onset of a throbbing headache that has been coming and going since 1 week and fever. The patient works in a pig slaughterhouse, and often consumes processed pork. There is no history of cavities, discharge from the ear.

On examination, vital signs showed blood pressure 120/80 mmHg, pulse rate 88 times/minute, respiratory rate 18 times/minute, temperature 38°C, pain scale could not be evaluated. On neurological clinical examination, Glasgow Coma Scale (GCS) E3V2M5 was found, meningeal stimulation signs were positive, without any impression of cranial nerve paresis and lateralization of force.

A chest X-ray did not reveal any abnormalities in the heart or lungs. A non-contrast CT scan of the head showed cerebral edema (**Figure 1A**). From complete blood laboratory examination, leukocytes 24000/uL, SGOT 62u/L, SGPT 54u/L, cerebrospinal liquor analysis obtained a slightly cloudy yellow color, negative none/pandy reaction, glucose 61, cell count 550, PMN 74, MN 26, The patient was found to have S.Suis type I in the blood,

joint fluid culture (+), and CSF culture (+). The patient received antibiotic therapy (Ceftriaxone 2 grams every 12 hours), corticosteroids (Dexamethasone 5 mg every 8 hours), antipyretics/ analgesic (paracetamol 1 gram every 8 hours). After the 3rd day of treatment the patient's condition improved, but the patient complained of pain in both knees and the patient's knees swelled on the 9th day of hospitalization, X-Ray results of the right and left knee showed soft tissue swelling and sclerotic on the joint surface (**Figure 1B**). Knee synovial fluid puncture was performed on the 9th day of antibiotic administration with the result of red fluid, increased leukocyte count (>50/Lp) with 95% polymorphonuclear dominance, erythrocytes and no monosodium urate crystals were found. In addition, the patient is still difficult to communicate with because he cannot hear so he is consulted to a rhinologist result diagnosis of bilateral sensorineural hearing loss as a complication of meningitis. The patient was discharged after the complaints of arthritis improved even though the hearing function was still not good. The patient was re-evaluated after 3 months and the hearing function normal.



Figure 1. (A) The results of imaging examination (CT scan) of the head with contrast show a picture meningoencephalitis with edema. (B) X-ray of patient A shows picture swelling of soft and sclerotic tissue on the surface of the joint.

DISCUSSION

S. Suis meningitis is a zoonotic bacterial meningitis due to infection with S. Suis bacteria due to exposure to infected pigs and pork products. This pathogen lives in pigs and can cause systemic diseases in humans such as meningitis, endocarditis, and sepsis in humans after contact and consumption of pigs.[1,2,4,5]

Patients with bacterial meningitis show the main symptoms of impaired consciousness, fever, stiff neck and headache. Other symptoms may be accompanied by focal neurologic deficits such as aphasia, hemiparesis, seizures and cerebral palsy.[3] The clinical manifestations of S. suis are generally similar to those of bacterial meningitis by other causes such as headache, fever, nausea

and vomiting accompanied by signs of meningeal irritation with onset of the disease in about 2-5 days. The most prominent and frequently reported symptom is hearing loss in more than half of cases. Hearing loss that occurs in *S. suis* infection is higher than that of other bacteria. Hearing loss is usually sensorineural, labyrinthine haemorrhage is occasionally seen on MRI, and is suspected to be the cause of deafness in patients with *S. Suis* meningitis.[4]

The diagnosis of *S. Suis* meningitis is based on clinical signs that support bacterial meningitis with pleocytosis of cerebrospinal fluid (CSF) features. The definitive diagnosis of meningitis is highly dependent on clinical examination, cerebrospinal fluid (CSF) culture and blood culture.[5]

Therapy for *S. suis* meningitis is basically the same as the treatment for bacterial meningitis in general, the administration of therapy is not only aimed at killing pathogenic bacteria but aims to reduce the resulting inflammatory response. Antibiotic therapy was given immediately without being present when the diagnosis was made. Choice of antibiotics using ceftriaxone or vancomycin (depending on the pattern of bacteria and culture resistance of each area). Dosage and duration of administration of the antibiotic ceftriaxone 2 grams every 12 hours for 14 days intravenously. Combination of bacteriolytic -lactam antibiotics with corticosteroids is the treatment of choice in adult bacterial meningitis.[5] In this case, he received ceftriaxone and dexamethasone therapy, the results of the blood culture of this antibiotic were still sensitive.

Complications due to *S. suis* infection are frequently reported with sensorineural deafness. The mortality rate for *S. suis* meningitis ranges from 3 to 26%. Death is frequently reported in cases of systemic infection such as hypotension, septic shock, multi-organ failure and disseminated intravascular coagulation (DIC).[1,4]

Pain in both knees complained of along with complaints of meningitis. Arthritis is one of the clinical manifestations of *S. suis* infection with the diagnosed of blood culture and synovial fluid culture showing positive *S. suis*.[5] Pain in both knees complained of by both patients with concomitant complaints of meningitis. Arthritis is one of the clinical manifestations from *S. suis* infection and has been reported in approximately 12.9% of cases.[6] Gustavsson and Ramussen reported a case of septic arthritis in a swine farmer in Sweden with chief complaint hip pain and fever (axillary temperature) 37.7o C). Synovial fluid culture examination positive for *S. suis* infection.[7] Cases Similar findings were also reported by Ceia et al, a pork seller complains of pain and swelling on the right wrist. Inspection blood culture and synovial fluid culture shows positive *S. switch*. Patient is discharged after 14 days of antibiotic therapy.[8] Symptoms of joint pain and swelling in patients co-occurring with clinical meningitis *S. suis* accompanied by the presence of increase in the number of leukocytes on fluid analysis joints can support the diagnosis of septic arthritis Joint fluid cultures in both cases were not shows the development of bacteria even though Synovial fluid analysis results support arthritis septic. This can be explained because both cases have been given antibiotics before joint fluid examination. Giving Antibiotics before culture examination can causes no bacterial growth on culture results.[9,10] This often happens especially in acute arthritis patients with evidence of presence of infection elsewhere Research by Feng et al explains bacteremia and meningeal infection can coexist in some cases of *S. suis* infection, so that cause symptoms of meningitis accompanied by septicemia.[11] *S. suis* can spread to other organs hematogenously which can cause various manifestations. Fernando et al provide one of the hypotheses that mention the intestinal mucosa as the door enter infection *S. suis*.[12] Antibiotic therapy of choice in both cases is ceftriaxone 2x2 g for

14 days. Studies a meta-analysis by van Shamkar et al reported the therapy of choice most often used for *S. suis* infection is ceftriaxone and penicillin as monotherapy and not found antibiotic resistance to the pus.[13]

CONCLUSION

Transmission of *S. suis* to humans occurs through direct contact with pork and its raw processed products. Clinical manifestations such as headache, fever, nausea and vomiting accompanied by signs of meningeal stimulation. *S. suis* infection is a systemic hematogenous infection that can show various clinical manifestations such as meningitis, sepsis, septic arthritis, endocarditis and endophthalmitis. Prompt diagnosis and appropriate and comprehensive treatment greatly affect the prognosis of patients with *S. suis* infection. The most prominent and frequently reported symptom is hearing loss. Definitive diagnosis is highly dependent on clinical examination, CSF culture and blood culture. Antibiotic therapy for 14 days, corticosteroids are the treatment of choice in bacterial meningitis. A frequently reported complication with sensorineural loss. Death is frequently reported in cases with systemic infection

Competing interests

No competing interests were disclosed.

Conflict of interest

The authors declare no conflict of interest, financial or otherwise.

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