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Case Report: Meningitis *Streptococcus suis* Presented with spondylodiscitis in Bali

I Made Oka Adnyana[1]*, Ni Made Susilawathi[1], Anak Agung Ayu Suryapraba Indradewi[1], Faldi Yaputra[1], Made Widhi Asih[2], Ni Nyoman Sri Budayanti[3], Sri Maliawan[4]

[1]Department of Neurology, Faculty of Medicine, Udayana University, Sanglah General Hospital, Bali, Indonesia; [2]Department of Radiology, Faculty of Medicine, Udayana University, Sanglah General Hospital, Bali, Indonesia; [3]Department of Clinical Microbiology, Faculty of Medicine, Udayana University, Sanglah General Hospital, Bali, Indonesia; [4]Department of Neurosurgery, Faculty of Medicine, Udayana University, Sanglah General Hospital, Bali, Indonesia

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***Correspondence:** I Made Oka Adnyana, Department of Neurology, Faculty of Medicine, Udayana University, Sanglah General Hospital, Bali, Indonesia. E-mail: okaadnyanadrsps@yahoo.com
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Abstract

BACKGROUND: Human infection of *Streptococcus suis* in Indonesia was increasing in the following years. Many cases presented with meningitis and sepsis, but in the current case, we presented a rare case of meningitis *S. suis* infection with spondylodiscitis.

CASE REPORT: A 60-year-old man, Balinese, presented with the 3-day onset of fever, headache, and nausea. Three-hour before admission, he became agitated and decreased of consciousness. He had a history of pork consumption 4 days before admission. He was subsequently diagnosed with acute bacterial meningitis and sensorineural hearing impairment. In the next 2 weeks, he developed low back pain, confirmed as spondylodiscitis from magnetic resonance imaging, a less common presentation of *S. suis* infection. After 4-week intravenous ceftriaxone treatment, he improved significantly with only hearing impairment remaining.

CONCLUSION: Meningitis suis is a systemic infection which can manifest in any organ. The clinician should suspect any low back pain as spondylodiscitis in a patient who had *S. suis* meningitis.

Background

Streptococcus suis is a Gram-positive microorganism, transmitted by pigs to human by direct contact with pigs. The most common clinical manifestation caused by this pathogen is meningitis followed by hearing impairment [1]. Other clinical presentations are sepsis, enteritis, arthritis, endocarditis, uveitis, and endophthalmitis [2],[3].

Since the first case of human infection of *S. suis* was reported in Denmark, in 1969 [1],[2],[3], many cases have been reported including in Indonesia. Bali is one of the provinces in Indonesia that the citizens are highly contacted with pigs or pork (https://bps.go.id/linkTableDinamis/view/id/1026). *S. suis* infection in human has been reported in Asia region; Japan 7 cases, Thailand 118 cases, Vietnam 293 cases, and China 332 cases [1]. Most of those cases presented with meningitis, spondylodiscitis caused by *S. suis* is rarely reported. We presented a case of *S. suis* infection with meningitis, spondylodiscitis, and hearing impairment.

Case Report

A 60-year-old man was admitted to the emergency room with a decrease of consciousness started gradually in the past 3 h. The family reported that the patient was agitated and spoke incoherently. He had fever, headache, nausea, and vomiting in the past 3 days. Others medical histories are non-specific, except he had consumed pork 4 days before admission.

In admission, the vital sign was stable, blood pressure 140/80 mmHg, heart rate 70 bpm, respiration rate 20/min, and body temperature 36.2°C. Clinical neurology examination revealed Glasgow Coma Scale $E_2V_4M_5$, neck stiffness, without any cranial nerve involvement, and other focal neurologic deficits. Routine laboratory test showed white blood cell count 10.63 × 10^3/μL, neutrophil count 90.84%, platelet 99.6 × 10^3/μL, C-reactive protein level of 110.94 mg/L, and random blood glucose level 163 mg/dL. Serologic test for hepatitis C, human immunodeficiency virus, and NS1 antigen for dengue was negative. In addition,

cerebrospinal fluid (CSF) analysis showed pleocytosis (766/mm^3) with polymorphonuclear 50%, increased protein level (692.7 mg/dL), and low CSF glucose (4 mg/dL) with CSF:blood glucose ratio 0.02. Head computed tomography scan with contrast was done, revealed a leptomeningeal enhancement and cerebral edema, suggesting a meningoencephalitis (Figure 1).

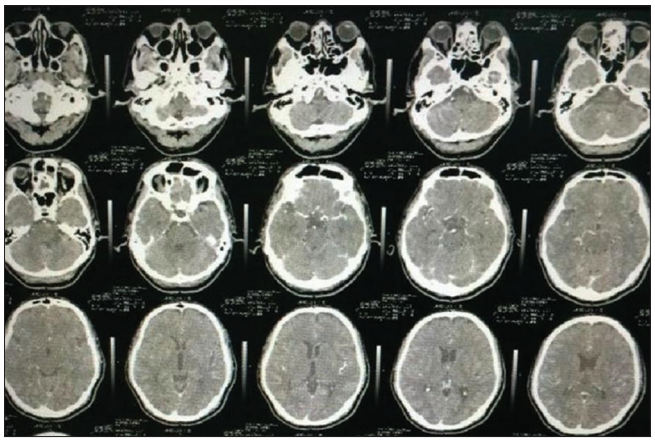

Figure 1: Axial head computed tomography scan with contrast at admission indicated meningitis

The patient was treated as an acute bacterial meningoencephalitis with intravenous antibiotic, steroid, and other supportive and symptomatic medications. One day after admission, he started to regain consciousness and complained of hearing impairment. We evaluated a bilateral sensorineural hearing impairment, consulted to the ENT department, and treated according to ENT protocol. After 4 days, the CSF culture revealed an isolated *S. suis* serotype II. He was diagnosed as bacterial meningoencephalitis caused by *S. suis* serotype II infection with bilateral sensorineural hearing impairment. In 2 weeks of treatment, the evaluation of CSF analysis was performed and it has improved compared to the previous CSF analysis result. The patient clinical condition also improved significantly and he was discharged with only hearing impairment remaining.

After 2 days of home care, he came back to the hospital complaining low back pain and hypesthesia on both legs. He started to feel this pain after the 1st time spinal tapping and get worse for 1 day before the second admission. He had difficulties when walking and had to be carried.

Vital signs ware stable, and numeric pain rating scale for the low back pain was 7–8. The lower extremities examination could not be done yet due to the pain. No other neurological deficits were found. Laboratory tests were ordered, complete blood count and CSF were normal. Lumbosacral magnetic resonance imaging revealed lumbar spondylosis, spondylodiscitis at L_5-S_1 corpus vertebra level, a central bulging disc herniation at L_4-L_5, and disc protrusion to the central and right foramina at the level of L_5-S_1 corpus vertebra (Figure 2).

Figure 2: Lumbosacral magnetic resonance imaging indicates a spondylodiscitis at L_5-S_1 corpus vertebra level

He was treated as low back pain caused by spondylodiscitis caused by *S. suis* serotype II infection. Treatment was as follows: IV acetaminophen 1 g every 8 h, IV ketorolac 30 mg if pain scale more than 3, IV ceftriaxone 2 g every 12 h, IV ranitidine 50 mg every 12 h, and diazepam 2 mg every night orally. The patient was consulted to neurosurgery and orthopedic department and no surgery was needed, conservative treatment was suggested. In 2 weeks of hospitalization, the symptom of low back pain was improved; he was discharged and scheduled for outpatient clinic visit in 1 week.

Discussion

Streptococcus infection, especially *S. suis* serotype II, needs a full concern, especially in preventing its emerging. Bali is one of the tourism destinations in Indonesia, with many traditional foods that consist of pork. Anyone that contacted pigs or pork material has increased the risk to be infected, such as pigs farmers, butchers, and veterinary practitioner [1]. The first human infection of *S. suis* was reported in 1968 in Denmark [2], [3], [4], [5], [6]. Many cases were followed, approximately 700–900 cases worldwide [2], [3]. In Southeast Asian countries, many cases were reported in China, Hong Kong, Japan, Korea, Thailand, and Vietnam [3]. A study in Hong Kong evaluated the etiology of bacterial meningitis in 65 adult patients for 10-year period. He found that *S. suis* was the third most frequent cause. Infective endocarditis and septicemia may occur as frequent as meningitis [7]. In 2005, 206 cases were reported in China with 38 deaths [8].

The first case of *S. suis* infection had been reported in Korea with meningitis, septicemia, and spondylodiscitis. The patient came to the hospital with headaches, fever, chill, and hearing impairment. They confirmed *S. suis* infection from CSF evaluation and culture. The patient was given ceftriaxone for 14 days,

but he developed back pain. The antibiotic substituted with ampicillin plus sulbactam, then the back pain resolved gradually. After 28 days of antibiotic therapy, the patient was discharged. The low back pain resolved completely after 1 month after discharge [2].

We reported the first case of *S. suis* serotype II infection in Indonesia who had a history of pork consumption 4 days before admission. He developed classic symptoms of acute bacterial meningitis with a headache, fever, neck stiffness, and altered mental status. The patient was treated with ceftriaxone for 14 days and discharged with the improvement of symptoms. He developed low back pain and hypesthesia on both legs on the 2nd day of discharge. He readmitted to the hospital and received another course of ceftriaxone for 14 days. The symptoms were improved and he was discharged after 14 days. He was a previously healthy man and had no predisposing factors, such as malignancy, asplenia, diabetes mellitus, and alcoholism.

The most common manifestation of *S. suis* infection is meningitis followed by sepsis. Our patient manifested the less common complication of *S. suis* serotype II infection which was spondylodiscitis in the late course of the disease. He responded well with antibiotic and did not require any surgery. Like another microorganism that causes bacterial meningitis, *S. suis* is susceptible to penicillin, ceftriaxone, and vancomycin [2].

Conclusion

Meningitis suis is a systemic infection which can occur in any organ. This disease transmitted by pork product. The best prevention for this infection is avoiding direct contact and consumption of raw pork product. Spondylodiscitis is a rare complication of meningitis *S. suis* infection, the clinicians should aware of any low back pain in *S. suis* infection.

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