International Journal of Research in Medical Sciences
Ali S et al. Int J Res Med Sci. 2017 Sep;5(9):4164-4166
www.msjonline.org
pISSN 2320-6071 | eISSN 2320-6012

DOI: http://dx.doi.org/10.18203/2320-6012.ijrms20173724

Case Report

Atypical presentation of *streptococcus salivarius* meningitis

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Received: 06 August 2017
Accepted: 18 August 2017

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ABSTRACT

Patient with past medical history significant for multiple co morbidities including hypertension, diabetes mellitus, paroxysmal atrial fibrillation (on Coumadin but sub-therapeutic INR on presentation), chronic systolic congestive cardiac failure/cardiomyopathy, aortic valve stenosis, mitral valve regurgitation presented with slurred speech. Due to concern for stroke, patient received initial CT scan head which was negative and admitted for further work up including MRI. Patient was also observed to be having shortness of breath and mild hypoxia in ED. Patient also had leukocytosis on complete blood count. Initial arterial blood gases results were within normal limits. CXR showed right lower lobe infiltrates suggestive of pneumonia. Infectious work up including blood cultures were also ordered. On clinical examination, no neck rigidity or any focal weakness. No facial droop either. No neurological abnormality other than slurred speech. In addition, patient was initiated on empirical coverage for possible pneumonia with consideration of aspiration event considering a sequela of stroke. Next morning, patient was able to speak clearly and stated that he did have headache few days before presentation. LP was ordered and patient found to have meningitis. Blood cultures grew *Streptococcus salivarius*. Patient received ceftriaxone and discharged without any complications in stable condition.

Keywords: Antimicrobial therapy, CSF (cerebrospinal fluid), LP (lumbar puncture), Meningitis, *Streptococcus salivarius*

INTRODUCTION

Bacterial meningitis is a very serious condition. Death can occur in as little as a few hours. Although, most people recover from meningitis but permanent disabilities like brain damage, hearing loss, and others can happen. Hence, early diagnosis and prompt treatment is pivotal.[1]

Common symptomatology include fever as with any infection and other symptoms include altered mental status, nuchal rigidity, headache, neurological deficits or seizures.[2]

However, in this case, patient presented with atypical symptomatology of slurred speech mimicking stroke.

By reviewing this case, clinicians will be able to suspect cases of bacterial meningitis even if they present in atypical fashion like case below.

CASE REPORT

90-year-old male with past medical history significant for multiple co morbidities including hypertension, diabetes mellitus, paroxysmal atrial fibrillation (on Coumadin but sub-therapeutic INR on presentation), chronic systolic congestive cardiac failure/cardiomyopathy, aortic valve stenosis, mitral valve regurgitation went to urgent care and drove himself to get there. Patient's presenting complaints at that time was slurred speech. Patient has received recent TAVR for aortic stenosis.

Due to concern for stroke, patient was referred to be seen in ED via EMS for further evaluation and management. At time of initial evaluation, patient was awake alert and appeared to be trying to give history and answer questions however his words were not understandable. No reported vomiting photophobia.

Patient did not have neck rigidity on exam Patient was also observed to be having shortness of breath and mild hypoxia in ED. Patient also had leukocytosis on complete blood count. Initial arterial blood gases results were within normal limits. CXR showed right lower lobe infiltrates suggestive of pneumonia. Infectious work up including blood cultures were also ordered. On clinical examination, no neck rigidity or any focal weakness. No facial droop either. No neurological abnormality other than slurred speech.

Work up initiated and CT scan of the head was negative. He was kept NPO and stroke work up including swallow evaluation, MRI with plan that if patient confirmed to have stroke on MRI, further evaluation with carotid duplex and ECHO will be undertaken.

In addition, patient was initiated on empirical coverage for possible pneumonia with consideration of aspiration event considering a sequela of stroke. Next morning, patient was able to speak clearly and stated that he did have headache few days before presentation. LP was ordered with results listed below.

Table 1: Results for lumbar puncture.

	Ref. range	
Glucose, CSF	Latest ref range: 40-70 mg/dL	36 (L)
Protein, CSF	Latest ref range: 15-45 mg/dL	2087 (HH)
Volume, fluid	Latest units: mL	8.0
Appearance, fluid	Latest ref range: clear	turbid (A)
Color, fluid	Latest ref range: colorless, straw	red (A)
RBC, fluid	Latest ref range: 0.0-5.0 /mcL	32000.0 (H)
Polys, fluid	Latest ref range: 0-5 %	92 (H)
Other cells, fluid	Latest units: %	8
Xanthochromia	Latest ref range: absent	present (A)
Tube number, CSF	Unknown	4
Total nucleated Cells	Latest ref range: 0.0-5.0 /mcL	8077.0 (HH)

MRI

MRI obtained same day showed abnormal fluid within the left ventricle concerning for proteinaceous fluid and infectious etiology. Patient was initiated on empirical regimen for bacterial meningitis after reviewing lumbar puncture results. Patient continued to do well and discharged in stable condition without any deficit.

Other work up listed below

Blood Cultures grew *Streptococcus salivarius* pansensitive. In addition, patient also received TEE and no vegetations were seen.

Written informed consent was obtained from the patient for publication of this case report. A copy of the written consent is available for review by the Editor-in-Chief of this journal.

DISCUSSION

Meningitis is an infectious and inflammatory disease of leptomeninges and affects arachnoid mater and CSF in both sub arachnoid space and the cerebral ventricles.

Per CDC, bacterial meningitis caused about 4,100 cases and 500 deaths in the United States each year between 2003 and 2007.[3]

Bacterial meningitis is very serious condition. Death can occur in as little as a few hours. Although, most people recover from meningitis but permanent disabilities like brain damage, hearing loss, and others can happen.

It can be community acquired or health care associated. There are several types of bacteria that can cause meningitis with leading causes for community acquired in the United States include *Streptococcus pneumoniae*, Group B streptococcus, *Neisseria meningitides*, *Haemophilus influenzae* and *Listeria monocytogenes*. For health care associated bacterial meningitis, staphylococci and aerobic gram-negative bacilli are most common.[4]

Common symptomatology include fever as with any infection and other symptoms include altered mental status, nuchal rigidity, headache, neurological deficits or seizures.

Blood work may show abnormal white cell count, platelet count. Leukopenia and thrombocytopenia correlate with

poor prognosis. Based on severity of infection, patients may have abnormal coagulation studies (DIC), metabolic acidosis or evidence of organ dysfunction like acute renal failure. Blood cultures are also very useful with more than 50 percent of cultures may turn positive. Most important test is examination of cerebrospinal fluid (CSF). It is crucial for diagnosis, identifying causative organism, and to guide treatment.

Per IDSA 2014 guidelines, CT scan head should be performed in adult patients with suspected bacterial meningitis who have one or more of the following risk factors.

- Immunocompromised state
- Hx of CNS disease (mass, stroke)
- New onset seizure (within one week of presentation)
- Papilledema
- Abnormal level of consciousness
- Focal neurological deficit.

Optimal antimicrobial treatment of bacterial meningitis requires bactericidal agents able to penetrate the blood-brain barrier with efficacy in CSF.[5] Antimicrobial therapy be initiated immediately after LP. Adjunctive dexamethasone should be given shortly before or at the same time as the first dose of antibiotics, when indicated.[6] The antibiotic regimen should be modified further when indicated based on CSF culture and susceptibility results.

CONCLUSION

Streptococcus salivarius is a member of human oral flora. Meningitis is a rare infection caused by Streptococcus salivarius but more and more cases are being reported. Majority of cases involve iatrogenic or traumatic CSF contamination like epidural anesthesia. Outcomes are generally favorable with appropriate antibiotic management.[7] *Streptococcus salivarius* should be suspected in patients presenting acutely after medical or surgical procedures involving the meninges.[8] Strict use of aseptic techniques including a facemask during diagnostic and surgical procedures may limit the incidence of this infectious complication. Thorough investigation of potential cases should be performed in order to prevent potential outbreaks from a single source. Most patients who develop infection with *Streptococcus salivarius* meningitis can safely be treated with a penicillin, third generation cephalosporin, or vancomycin with a good clinical outcome and cure.[8] In case discussed above, patient developed spontaneous meningitis.

ACKNOWLEDGEMENTS

Authors would like to acknowledge hospitalist service (sound physicians) recognized for contribution to data collection and literature review

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: Not required

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Cite this article as: Ali S, Hussain T. Atypical presentation of streptococcus salivarius meningitis. Int J Res Med Sci 2017;5:4164-6.