

CASE REPORT

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Beta-hemolytic group B Streptococcus meningitis in a young healthy woman

Li Han, Rohit Gosain, Maria Plataki, Daniel Horowitz, Daniel Bordea

ABSTRACT

Introduction: Group B Streptococcus (GBS) is the leading cause of bacterial meningitis and sepsis in neonates but is a rare cause of meningitis in adults. The GBS infections in adults include bloodstream infections, pneumonia, skin and soft-tissue infections, and bone and joint infections. **Case Report:** A 23-year-old woman with a past medical history of stroke at the age of four and *Staphylococcus aureus* toxic shock syndrome at age 10 was presented to the emergency department with three days of worsening frontal headache, fatigue and mild confusion. Patient denied fever, photophobia, neck stiffness, nausea and vomiting. Brudzinski's sign and Kernig's sign were negative. Laboratory data showed initially elevated WBC ($13.5 \times 10^3/\mu\text{L}$) and normal metabolic panel. Cerebrospinal fluid (CSF) analysis was normal with two white cells, all lymphocytes. After two days of hospitalization, she was back to her normal state without any headache or confusion and was discharged home. One day after discharge, both urine and CSF culture grew β -hemolytic GBS but

with negative blood cultures. She was readmitted and placed on ceftriaxone 2g IV twice daily for 14 days. **Conclusion:** This case illustrates an unusual presentation of group B Streptococcus meningitis. Internists should be aware of atypical group B Streptococcus meningitis and consider treating patients with empiric antibiotics on clinical suspicion.

Keywords: Group B Streptococcus, β -hemolytic

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INTRODUCTION

Group B Streptococcus (GBS) is gram-positive β -hemolytic coccus characterized by the presence of group B Lancefield antigen and the main virulence factor is the polysaccharide anti-phagocytic capsule. The GBS is the leading cause of bacterial meningitis and sepsis in neonates but it is a very rare cause of meningitis in adults. The GBS infections in adults include bloodstream infections, pneumonia, skin and soft-tissue infections, and bone and joint infections. This organism has been recognized with increasing frequency as a substantial cause of morbidity and mortality among non-pregnant adults.

CASE REPORT

A 23-year-old woman with a past medical history of stroke at the age of four and *Staphylococcus aureus*

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toxic shock syndrome at age 10 was presented to the emergency department with three days of worsening frontal headache, fatigue and mild confusion. She complained of continuous throbbing-like headache in the left frontal lobe, which she rated as 8 on a severity scale of 10. Patient denied fever, photophobia, neck stiffness, nausea and vomiting. In the emergency department, she was found to be confused with behavioral changes such as trying to scan one of her cards on the Purell hand sanitizer machine and clicking her car remote control to turn on the TV. Physical examination was normal except for a 2/6 systolic murmur at the apex with no radiation. No nuchal rigidity or focal neurological deficit was observed. Brudzinski's and Kernig's signs were negative. Laboratory examination showed initially elevated WBC $13.5 \times 10^3/\mu\text{L}$ that went down to $9.5 \times 10^3/\mu\text{L}$ the next day and normal metabolic panel. Cerebrospinal fluid (CSF) analysis was normal with two white cells, both lymphocytes (Table 1). Computed tomography (CT) scan of the head showed no acute intracranial abnormality. Magnetic resonance imaging (MRI) of the brain revealed encephalomalacia in the left frontal lobe but no acute infarction (Figure 1). Electroencephalogram (EEG) was slightly abnormal with occasionally increased amount of intermittent delta activity, seen mostly in the frontal central areas bilaterally. This finding could correlate with the patient's clinical confusion. Transthoracic echocardiogram showed mild concentric left ventricular hypertrophy with ejection fraction 60–65%, trace mitral and tricuspid regurgitation. After two days of hospitalization without using any antibiotics, she was back to her normal state without any headache or confusion and was discharged home. One day after discharge, both urine and CSF culture grew β -hemolytic GBS. Blood cultures were negative. Urinalysis showed specific gravity 1.03, leukocyte esterase negative, nitrate negative, white blood cell count $<5/\text{Hpf}$, glucose negative, protein negative, ketones negative. CSF culture showed 4 colonies of β -hemolytic GBS and urine culture showed 50,000 organisms/mL. She was readmitted and placed on ceftriaxone 2 g IV twice daily for 14 days. Further laboratory work-up included HIV testing, and immunoglobulin level measurement both were negative. Computed tomography of the abdomen and pelvis was performed and abscess was excluded. She was discharged home to complete 14 days of intravenous antibiotic treatment.

DISCUSSION

The GBS is a gram-positive β -hemolytic streptococci and bacitracin resistant organism. It is a part of the normal flora of gastrointestinal tract, upper respiratory tract and genital tract in both men and 15–45% women [1]. However, GBS is capable of causing serious infections, primarily in neonates, pregnant women and immunocompromised individuals. Neonates acquire GBS infection in utero or during passage through vagina. Physiological changes

Table: Cerebrospinal fluid (CSF) analysis.

Apperance	Pressure (cmH ₂ O)	WBC, Predom	Glucose (mg/dL)	Protein (mg/dL)
Clear	12	2, lymphocytes	58	28

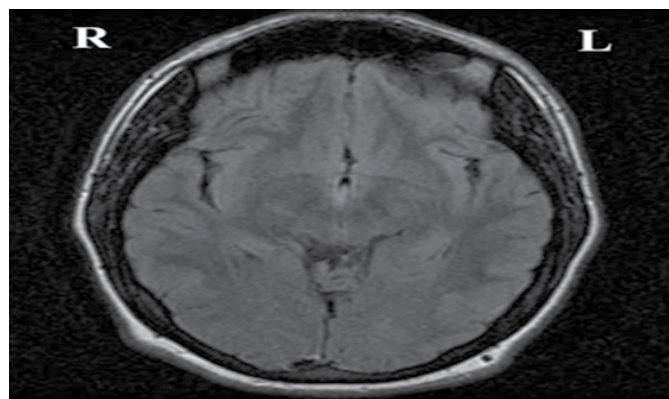


Figure 1: Magnetic resonance imaging scan of brain: Small ovoid focus of signal abnormality in the left frontal lobe, likely representing encephalomalacia given the clinical history of stroke as a young child. No evidence of acute infarction or evidence of acute parenchymal hemorrhage.

in pregnant women make them more susceptible to GBS infections, mainly in the urinary tract where the bacteria are found in high numbers. However, rarely it may also affect non-pregnant or immunocompetent adults, such as those diagnosed with diabetes mellitus, malignancy, HIV infection, and advanced hepatic renal disease [2]. Incidence of invasive GBS infections has increased by 2–4 folds in the past two decades and approximately two-thirds of these cases are observed in adults [3].

Classical cases of bacterial meningitis presents with diffuse headaches, fever, nuchal rigidity, and change in mental status [4, 5]. Some patients have temperatures ranging above 38°C , and some present with hypothermia, but it is important to note that no one presents with normal temperature [6]. However, our case was unique such that the patient denied fever and presented with headache, confusion and normal CSF analysis.

CONCLUSION

We report a very unique case of group B *Streptococcus* meningitis in a 23-year-old non-pregnant immunocompetent female. The patient did not present with classical triad of typical bacterial meningitis, rather with headache, confusion and normal cerebrospinal fluid analysis. This patient acquired the infection probably from urinary tract because both the urine and cerebrospinal fluid cultures are positive for β -hemolytic

group B Streptococcus. Internists should be aware of atypical group B Streptococcus meningitis and consider treating patients with empiric antibiotics.

Author Contributions

Li Han – Substantial contributions to conception and design, Analysis and interpretation of data; Drafting the article, Final approval of the version to be published

Rohit Gosain – Substantial contributions to conception and design, Acquisition of data; Drafting the article, Revising it critically for important intellectual content, Final approval of the version to be published

Maria Plataki – Substantial contributions to conception and design, Revising it critically for important intellectual content, Final approval of the version to be published

Daniel Horowitz – Substantial contributions to conception and design, Revising it critically for important intellectual content, Final approval of the version to be published

Daniel Bordea – Substantial contributions to conception and design, Revising it critically for important intellectual content, Final approval of the version to be published

Guarantor

The corresponding author is the guarantor of submission.

Conflict of Interest

Authors declare no conflict of interest.

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