

Case Report

Group B streptococcal infective endocarditis in a young non-pregnant female with rheumatic heart disease - A Case Report

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Abstract

Group B *Streptococcus* (GBS) is a rare cause of infective endocarditis in adults associated with a high mortality rate due to the frequent occurrence of local and systemic complications. Here we report a case of infective endocarditis (IE) in a young non-pregnant female with a history of rheumatic heart disease (RHD) who presented with a short history of fever, shortness of breath and constitutional symptoms. GBS was isolated from a single blood culture along with echocardiographic findings of a cardiac vegetation and ophthalmologic findings of a Roth spot. Based on the Modified Duke Criteria, a definitive diagnosis of infective endocarditis was made. She was treated with a prolonged course of intravenous (IV) ceftriaxone, with gentamicin being added to the regimen, following which she made a complete recovery.

Keywords: Group B Streptococcus, Infective endocarditis, Roth spot, Bacteraemia, Rheumatic heart disease

Introduction

GBS is a known colonizer of the female genital tract¹, with a potential to cause severe infection in newborns and pregnant women.² However, cases of invasive GBS infection among elderly adults are increasingly being reported.³ Endocarditis occurs in a proportion of them resulting in a high mortality rate⁴ due to frequent complications.⁵

Case report

A 32 year old female presented with a one day history of fever with chills, cough, headache and vomiting. Shortly after admission to hospital, she developed shortness of breath and visual blurring in her right eye. She had a history of RHD causing mitral stenosis, which was diagnosed

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during the 3rd trimester of pregnancy. However, antibiotic prophylaxis was not given. Delivery was via elective caesarian section (with no history of prolonged rupture of membranes or prolonged labor) 7 months prior to this presentation, without any unfavorable outcomes for the mother or baby. She was not screened for GBS vaginal colonization during her pregnancy. The rest of her past medical and surgical history was unremarkable.

On examination she was ill looking and febrile, with a blood pressure of 120/80 mmHg and a pulse rate of 92 beats per minute. Investigations showed an elevated white blood cell (WBC) count ($13.6 \times 10^9/L$) with 92.8% neutrophils and C reactive protein level (CRP) of 204 mg/L. A single blood culture yielded Gram positive cocci in chains resembling streptococci after 8 hours of incubation. The organism was identified as Lancefield Group B streptococci (*Streptococcus agalactiae*) and its antibiotic sensitivity pattern was assessed via BD Phoenix (Becton, Dickinson and Company, USA). Its minimum inhibitory concentration (MIC) for penicillin was $\leq 0.03125 \mu\text{g/ml}$.

The patient was initially managed as a left lower lobar and right bronchopneumonia (with suggestive X ray features) and treated with piperacillin/tazobactam, levofloxacin and vancomycin. A provisional diagnosis of IE was made after obtaining the blood culture report and the patient was further investigated as described below.

Following an unremarkable bedside transthoracic echocardiogram (TTE), a repeat TTE done two days later by the same cardiologist at the Cardiology Department showed a vegetation measuring 2-3 mm nested in the anterior aspect of the anterior mitral valve leaflet. No complications of endocarditis such as valve perforation or abscesses were noted. Ophthalmological examination revealed a Roth spot in the macular region of her right eye (which caused visual blurring) (Fig. 1). A CT scan of the brain revealed no abnormalities.

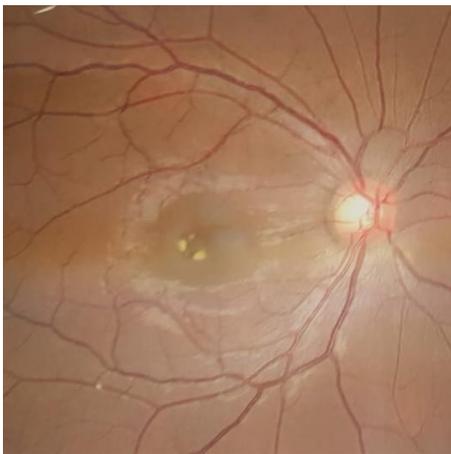


Fig.1: Roth spot in the macular region of the right eye

According to the Modified Duke Criteria⁶, a definitive diagnosis of IE was made on day 5 of illness based on the presence of one major criterion (cardiac vegetation) and four minor criteria (predisposition due to mitral stenosis, fever $> 38^{\circ}\text{C}$, immunological phenomenon of a Roth spot and a single positive blood culture). As per the current guidelines⁶, on the same day the patient was started on IV ceftriaxone 2g daily, to be continued for 4 weeks, with IV gentamicin 3mg/kg/day as a daily dose during the first 2 weeks.

A repeat blood culture taken 6 days after the initial positive culture and following 4 days of treatment with ceftriaxone was negative. A repeat TTE done 2 weeks after commencing treatment showed an improvement of the previously noted vegetation. The patient was

discharged in order to complete the final two weeks of IV antimicrobial therapy as an outpatient. On discharge her WBC count was $5.9 \times 10^9/L$ and CRP was 13mg/ml. However, 5 days after discharge she was readmitted, complaining of fever. A blood culture done during that admission was negative and a repeat TTE found the previously noted oscillating mass on the anterior mitral valve leaflet to be minimal (1.5mm) with no valve distortion or complications. WBC count was normal ($7.8 \times 10^9/L$) and CRP was 8mg/ml. The patient was offered a transoesophageal echocardiogram (TOE) for which she refused consent. Taking these into consideration, the treatment duration of IV ceftriaxone was extended by a further 2 weeks. Renal functions were monitored regularly, and hearing assessments were done during treatment with gentamicin, with no adverse effects being noted. She was subsequently placed on antibiotic prophylaxis for RHD. At the time of writing she was asymptomatic for 3 months.

Timeline of the illness is given below.

Time	Description of events
Day 1	<ul style="list-style-type: none"> Acute onset fever, cough, headache and vomiting
Day 2	<ul style="list-style-type: none"> Admission to hospital; developed shortness of breath and visual blurring of right eye WBC= $13.6 \times 10^9/L$, CRP=204 mg/dL, chest X ray: bilateral pneumonia Started on IV piperacillin/tazobactam and oral levofloxacin
Day 3	<ul style="list-style-type: none"> Blood culture: Gram positive cocci in chains Started on IV vancomycin Bedside 2D echocardiogram: rheumatic heart disease, no features of endocarditis USS abdomen: no abnormalities detected
Day 4	<ul style="list-style-type: none"> CRP=213 mg/dL Continued with IV vancomycin Omitted other antibiotics
Day 5	<ul style="list-style-type: none"> Repeat 2D echocardiogram at Cardiology Department: Endocarditis diagnosed Blood culture: Group B <i>Streptococcus</i>, sensitive to penicillin G Omitted IV vancomycin Started on IV ceftriaxone and IV gentamicin Ophthalmological examination: ??Roth spot in right macula (too ill for OCT)
Day 7	<ul style="list-style-type: none"> CT brain: no abnormalities detected BD Phoenix ID: Group B <i>Streptococcus</i>, penicillin MIC $\leq 0.03125 \mu\text{g/mL}$
Day 8	<ul style="list-style-type: none"> Patient afebrile, clinical improvement noted Roth spot in macular region of right eye confirmed Blood culture repeated: No growth
Day 19	<ul style="list-style-type: none"> 2D echo: improvement of previously noted vegetation WBC= $5.9 \times 10^9/L$, CRP=13 mg/dL Patient discharged to complete two weeks of OPAT
Day 24	<ul style="list-style-type: none"> Readmitted with on and off fever WBC=$7.8 \times 10^9/L$, CRP=8 mg/dL
Day 28	<ul style="list-style-type: none"> Afebrile, clinically well 2D echo: Previously noted vegetation now minimal Planned to complete a total of 6 weeks of IV ceftriaxone prior to discharge
Day 90	<ul style="list-style-type: none"> Asymptomatic, clinically well

Discussion:

GBS is a colonizer of the genital tract in up to 40% of women worldwide.¹ A Sri Lankan study found that GBS colonization reached up to 30% among pregnant mothers⁷, giving it the potential to cause severe infection in newborns and pregnant women due to ascending spread along the reproductive tract.² However, recently it has also been increasingly involved in causing invasive infection among elderly adults.³ Risk factors for invasive GBS infection include diabetes mellitus, malignancy, neurologic disorders, hepatic disease, and skin disease.³ However, in this patient, no such risk factors were present apart from RHD which predisposes to IE with any causative organism. Investigations (i.e. urine culture, abdominal ultrasound scan, etc) failed to reveal the source of bacteraemia in this patient.

IE accounts for 2-18% of invasive GBS infections.² It progresses rapidly, culminating in a mortality rate reaching 47%.⁴ This could be attributed to frequent local and systemic complications including heart failure, valvular destruction and systemic embolization.⁵ The rate of embolization could reach 50% in these patients⁴, partly due to the large size and increased friability of vegetations which are common in GBS endocarditis.¹ While a CT scan of the brain was done in our patient to exclude embolization as a cause for visual blurring, no such imaging (apart from a chest X ray) was performed to exclude it as a cause for her respiratory symptoms. The presence of visual blurring itself makes this case significant since patients with endocarditis presenting with early onset visual symptoms has only rarely been documented.⁸

Administration of a beta-lactam antibiotic (penicillin or ceftriaxone) for 4 to 6 weeks with gentamicin being added in the first 2 weeks is recommended for treatment of IE. Vancomycin is recommended for those with beta-lactam allergy.⁶ Patients with RHD should also receive antibiotic prophylaxis.⁹

Conclusion

This case showcases GBS as a cause of IE occurring in a predisposed young adult with no risk factors for invasive GBS infection and with no identifiable source of bacteraemia. Early diagnosis was facilitated by the isolation of GBS from a blood culture. Management should consist of a prolonged course of a beta-lactam, combined with gentamicin, as opposed to short term antibiotic therapy.

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Conflict of interest: None declared.

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