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Streptococcus gallolyticus Endocarditis Complicating Rheumatic Heart Disease - A Case Report

A. Benedict Vinothini[1], K. P. V. Hyma[1], Naveen Arul[2], K. V. Vinod[2], Apurba S. Sastry[1] and S. Mythilipraba[1*]

[1]*Department of Microbiology, Jawaharlal Institute of Postgraduate Medical Education and Research, Puducherry, India*
[2]*Department of Medicine, Jawaharlal Institute of Postgraduate Medical Education and Research, Puducherry, India*

**Corresponding author*

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A B S T R A C T

Streptococcus gallolyticus, a member of group D enterococci is a significant cause of infective endocarditis and bacteremia. It is usually associated with colonic neoplasia in most cases of bacteremia. We present a case of *Streptococcus gallolyticus* endocarditis in a 40-year-old male patient with underlying rheumatic heart disease. He had low grade intermittent fever, breathlessness, syncope, profuse night sweats and loss of weight. Mid diastolic murmur was heard over the mitral area and loud P2 heard over pulmonary area on cardiovascular examination. Three sets of blood cultures were obtained, all of which grew *Streptococcus gallolyticus* subsp. *gallolyticus.* The patient was treated with ceftriaxone and gentamicin and planned for valve replacement and screening for colonic neoplasm. To conclude, prompt identification and management of *S. gallolyticus* endocarditis are essential to mitigate the risk of valve destruction and underlying colonic neoplasia.

Introduction

Streptococcus gallolyticus, a typical pathogen of infective endocarditis, is closely linked to colorectal cancer, posing a significant threat to public health. (1)Characterized by its unique association with colorectal malignancy and variable antibiotic resistance patterns, *S.gallolyticus* endocarditis necessitates timely diagnosis, tailored treatment, and interdisciplinary collaboration. Rheumatic heart disease has historically been identified as the most significant risk factor for the development of infective endocarditis. We present a case of *Streptococcus gallolyticus* endocarditis complicated by underlying rheumatic heart disease achieving bacteriological cure with ceftriaxone and gentamicin.

Case History

A 40-year-old male was admitted in medical ward with dyspnoea and palpitations for 1 month. Dyspnoea was gradually progressive from class II to class III by the New York Heart Association (NYHA) classification system. He had low grade intermittent fever associated with chills over the past 10 days. He also had

paroxysmal nocturnal dyspnoea, profuse night sweats, dry cough, syncope and loss of weight. He was not known to have diabetes mellitus, hypertension or other non-communicable diseases. He was recently diagnosed to have rheumatic heart disease associated severe mitral stenosis with a mitral valve area of 0.9cm^2. He was on phenoxy methyl penicillin 250 mg BD for secondary prophylaxis of rheumatic fever. On general examination he was afebrile, and his vitals were stable. Grade 2 clubbing was noticed. On cardiovascular examination, mid diastolic murmur was heard over the mitral area and loud P2 heard over pulmonary area. Electrocardiogram revealed 'q' waves in II, III and aVF leads and T wave inversions in leads III and V1.

Transthoracic echocardiogram revealed severe mitral valve stenosis, moderate-severe mitral valve regurgitation with thickened anterior mitral leaflet and hyperechoic shadow- likely of healed vegetation, restricted movement of posterior mitral leaflet which was calcific, dilated left atrium, mild tricuspid regurgitation and normal left ventricular systolic function with EF 55%. Complete hemogram, liver and renal function tests were found to be normal except for increased eosinophil counts (Eosinophil – 12.6%, AEC – 1.37 x10^3/ µl). With clinical diagnosis of infective endocarditis 3 sets of blood cultures were sent over a period of 1hour which were incubated in in BACT/ALERT Virtuo, BioMérieux automated blood culture system. With a mean time to positivity of 41 hours all 6 bottles flagged positive and direct gram staining revealed gram-positive cocci in pairs and short chains.

Alpha hemolytic colonies were grown on blood agar and MALDI TOF MS identified the organism as *S. gallolyticus* subsp. *gallolyticus*. Antimicrobial susceptibility testing of the isolate was done using VITEK. Penicillin, ceftriaxone, levofloxacin, erythromycin, clindamycin, vancomycin and linezolid were sensitive and tetracycline showed intermediate sensitivity. The patient was given ceftriaxone 2g IV q24h and gentamicin 1mg/kg IV q8h for 2 weeks and repeat cultures sent were sterile. The patient was discharged with ceftriaxone and gentamicin to complete the antibiotic course and review after 4 weeks for valve replacement.

Discussion

Streptococcus bovis type 1, now renamed as *Streptococcus gallolyticus* is increasingly been reported as a causative agent of infective endocarditis. It is a gram positive non motile cocci producing alpha hemolytic or non hemolytic tiny colonies on blood agar. The name *S. gallolyticus* reflects the bacterium's capacity to metabolize gallate, an organic acid derived from tannin hydrolysis. (2) Though it is found as a normal inhabitant of the gastrointestinal tract in 2.5 to 15% of humans, it is considered an opportunistic pathogen in elderly and immunocompromised people (3). 11 – 14% of the culture positive endocarditis and 24% of streptococcal endocarditis is attributed to *S. gallolyticus* (3, 4).

S. gallolyticus, consists of three subspecies, *S. gallolyticus* subsp. *gallolyticus* (biotype I), *S. gallolyticus* subsp. *pasteurianus* (biotypeII), and *S. gallolyticus* subsp. *macedonicus*. *S. gallolyticus* subsp. *gallolyticus*, isolated from our patient, exhibits a stronger link to infective endocarditis in bacteremia cases than its counterpart, *S. gallolyticus* subsp. *pasteurianus*. (5)

The presence of rheumatic heart disease in our patient served as a predisposing condition for the development of infective endocarditis. Typical symptoms of infective endocarditis such as fever, night sweats, and loss of weight were seen in the patient along with other symptoms of rheumatic heart disease such as syncope and breathlessness.

The usual associations of *S. gallolyticus* endocarditis, such as advanced age, fewer valve issues, and increased neurological/embolic complications (6), were not observed in our case, except for the male preponderance.

Streptococcus gallolyticus generally exhibits susceptibility to penicillin and cephalosporins, but resistance rates vary for macrolides, clindamycin, fluoroquinolones, and co-trimoxazole, with significant resistance to erythromycin and clindamycin. (7). Our isolate was susceptible to all tested drugs including penicillin and cephalosporin and the patient was started on ceftriaxone and gentamicin combination therapy and bacteriological cure was obtained with 2 weeks of treatment.

Streptococcus gallolyticus bacteremia is associated with colorectal cancer along with other sulfidogenic bacteria such as *Fusobacterium*, Bilophila *wadsworthia* and *Desulfovibrio.* The incidence of colorectal cancer is as high as 33-71% in patients with *S. gallolyticus* bacteremia or endocarditis. (8) Increased eosinophil

count is another predicting factor for colorectal cancer. Linear increase in peripheral absolute eosinophil count is associated with increased risk of colorectal cancer. (9) In our patient *S. gallolyticus* subsp. *gallolyticus which is a bacterial driver for* colorectal cancer was isolated from blood and an increased absolute eosinophil count was present. Therefore, a follow-up complete hemogram is scheduled to monitor the trend of eosinophil count and investigate potential underlying colonic cancer.

In conclusion, *S. gallolyticus* subsp. *gallolyticus* is an identified cause of infective endocarditis which requires prompt identification and treatment. The association with colorectal cancer highlights the importance of thorough investigation and screening in patients with S. gallolyticus endocarditis.

Author Contributions

A. Benedict Vinothini: Writing – Original Draft Preparation; K. P. V. Hyma: Writing - Review & Editing. Naveen Arul:— Data Curation. K. V. Vinod: Supervision. Apurba S. Sastry: Supervision. S. Mythilipraba: Writing - Review & Editing.

Data Availability

The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

Declarations

Ethical Approval Not applicable.

Consent to Participate Not applicable.

Consent to Publish Not applicable.

Conflict of Interest The authors declare no competing interests.

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