

Significantly Elevated Rheumatoid Factor in a Patient with Infective Endocarditis: A Case Report and Literature Review

Nazish Malik*, David Kelley, Samir Dalvi

Department of Rheumatology and Immunology, University of Arkansas for Medical Sciences, Little Rock, AR

*Corresponding author: nmalik@UAMS.com

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Abstract A 49-year-old male with unremarkable history presented with six months of dry cough, migratory pain in the lower extremity joints, intermittent fever, and unintentional weight loss. He had partial relief from initial steroid therapy but continued to have symptoms. Physical Examination showed a systolic murmur and moderate swelling of the right ankle. On lab work up, The ESR was elevated to 64 mm/hr, the rheumatoid factor was 368 IU/mL, serum ferritin was 570 ng/mL, while the ANA was positive at 1:640 speckled pattern. Blood cultures grew *Streptococcus Mutans* suggestive of infective endocarditis. Echocardiogram revealed a bicuspid aortic valve with moderate aortic stenosis, mild aortic regurgitation, and an oscillating echo density on the aortic valve suggestive of vegetative growth. The patient was treated with oral Linezolid (600 mg BID) despite initial refusal of hospitalization and referred for cardiology follow-up. He underwent aortic and mitral valve replacement without postoperative complications. This case raises awareness of the importance of considering infective endocarditis in the differential diagnosis of patients presenting with systemic inflammatory symptoms and positive rheumatologic work up.

Keywords: Infective Endocarditis, Rheumatoid Factor, *S. Mutans*, Linezolid

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1. Introduction

IE is an uncommon but life-threatening condition which can present with a variety of signs and symptoms leading to diagnostic dilemmas [1]. Although different diagnostic criteria have been proposed so far for diagnosing IE, the modified Duke's criteria are one of the commonly adopted methods of choice with some major and minor elements [2]. The major components of Duke's criteria are considered significant in diagnosis, but literature have suggested the paramount significance of minor criteria as well which includes the role of immunological association of IE. According to literature the diagnosis of IE can be more challenging in association with positive immunological Markers [3]. Various immune markers have been tested and found to be associated with IE like ANCA directed against proteinase-3 (PR3) or myeloperoxidase (MPO) leading to not only the diagnostic challenge but impacting the choice of treatment as well [4]. We report a case of infective endocarditis (IE) where the presence of a positive rheumatoid factor (RF) served as a diagnostic masquerade highlighting the association between autoimmune serology and this infectious condition.

2. Case Presentation

A 49-year-old male with no significant past medical history presented with a 6-month history of persistent dry cough, migratory joint pain in the lower extremities (knees and ankles), intermittent fever, chills, and a 10-pound weight loss. Steroid treatment by his primary care physician provided partial relief, but symptoms persisted. He denied rash, eye symptoms, or other systemic complaints.

Examination revealed a systolic murmur and mild swelling in the right ankle, with no significant joint tenderness, lymphadenopathy, nodules, or rashes. Laboratory tests showed elevated ESR, CRP, RF, ferritin and ANA level and mild anemia of Hb 10.6 g/dL.

Table 1. Inflammatory Markers

Test	Result	Reference Range
ESR	64 mm/hr	3 – 12 mm/ hour.
CRP	58 mg/ L	0 – 5 mg/L
Rheumatoid factor	368 IU/ mL	(0-40 iu/ml)
ANA level	1:640 speckled	0-27 IU/ml

He had positive ANCA (antineutrophil cytoplasmic

antibodies) directed against PR-3 (Proteinase 3/62 AU/mL). Blood cultures grew *Streptococcus mutans*. A chest X-ray was unremarkable, and a CT chest was not performed due to patient refusal. Echocardiography revealed a bicuspid aortic valve with moderate stenosis (valve area 1.2–1.4 cm), mild regurgitation, an oscillating echo density on the aortic valve indicative of vegetative growth, mild left ventricular hypertrophy with grade I diastolic dysfunction, and ascending aortic dilation (4.7 cm).

The patient was diagnosed with infective endocarditis secondary to *Streptococcus mutans* and was prescribed Linezolid 600 mg BID. He subsequently underwent successful aortic and mitral valve replacement without complications.

3. Discussion

The presence of highly elevated RF in this patient aligns with previous literature linking RF with IE. This finding supports earlier reports by Raoult et al., who observed elevated RF levels in most IE patients without underlying rheumatologic diseases [5]. Similarly, a case reported by Ghosh et al. highlighted that positive RF could precede an IE diagnosis, often leading to diagnostic delays and mimicking autoimmune conditions such as rheumatoid arthritis or systemic lupus erythematosus [6].

These findings in this case are well-supported, where high ESR and ferritin level, along with positive ANA 1:640 speckled pattern, have also been noted in other cases of IE. For instance, among the IE patients, Van Gool et al. have reported raised ESR along with a positive titre of ANA that again suggested that these two markers were not specific but part of an overall inflammatory response [7]. The positive ANA and ANCA (antineutrophil cytoplasmic antibodies) directed against PR-3 of our patient, though rare in cases of IE, correlates with similar sporadic reports in the literature, further expanding the list of differential diagnosis of IE. This points to findings from the work of Mahr et al., who noted that ANA can be positive in some patients with IE, especially in those with prolonged inflammation or chronic infection, but whose role remains less defined in routine clinical practice [8]. Positive antineutrophil cytoplasmic antibody (ANCA) is a key diagnostic marker for ANCA-associated vasculitis (AAV), a group of disorders characterized by inflammation of small blood vessels. However, ANCA can also be detected in various other conditions, such as ulcerative colitis, Crohn's disease, systemic lupus erythematosus, and certain infections, including infective endocarditis and tuberculosis [10].

Echocardiographic findings played a crucial role in the diagnosis and management of this case, revealing a bicuspid aortic valve with moderate stenosis and vegetative growth. Several studies have established a connection between bicuspid aortic valves and an increased risk of developing infective endocarditis (IE). For example, Lamas et al. highlighted that congenital defects, such as bicuspid aortic valves, predispose patients to a higher risk of IE and are often associated with complications like valvular damage. [13]

These findings align with our patient, who presented with vegetative growth on the aortic valve and underwent

successful valve replacement surgery. This is further supported by a review by Yuan et al., which emphasized the value of echocardiography in diagnosing IE, particularly in detecting vegetations and structural valve abnormalities. [14] Additionally, our patient had mild stenosis, a factor discussed in a systematic review by Pereira et al., which noted that the degree of stenosis in bicuspid valves can increase the risk of IE and complicate clinical management. [15]

In addition, early surgical intervention is strongly supported by literature. Malmberg M et al. emphasized that valve replacement is particularly indicated in cases of IE with significant valvular destruction, large vegetations, or an elevated risk of heart failure. [17] In this case, the successful valve replacement surgery aligns with previous studies, which demonstrate improved survival rates and fewer complications when surgical management is implemented in a timely manner.

In the light of above given description, the present case study has pointed out the need for recognition of varied clinical manifestations of IE. Fever is the most common symptom. It can be associated with chills, anorexia, night sweats, weight loss, loss of appetite, malaise, headache, myalgias, arthralgias, abdominal pain, dyspnoea, cough, and pleuritic pain.

Cardiac murmurs are observed in about 85% of patients. Congestive heart failure develops in 30% to 40% of patients usually due to valvular dysfunction. Other signs include cutaneous manifestations such as petechiae or splinter haemorrhages (non-blanching linear reddish-brown lesions under the nail bed). timely diagnostic and surgical interventions, which is recognized from the preceding literature.

4. Conclusion

This case illustrates the importance of timely diagnosis of IE that is a complex and challenging illness. Successful management often requires multidisciplinary teams to collaborate on the management of infective endocarditis.

Patients with infective endocarditis often develop highly variable signs and symptoms. The disease may present as an acute, subacute, or even chronic entity, depending on causative microorganisms, underlying cardiac conditions, and pre-existing comorbidities. Ninety percent of patients with infective endocarditis will have fever, often accompanied by night sweats, malaise, fatigue, anorexia, and weight loss. A quarter of infective endocarditis patients present with embolic phenomena such as sudden onset of blindness, abdominal pain from splenic or renal infarction, or stroke. The diagnosis of infective endocarditis should be entertained in all individuals with predisposing conditions who present with fever, a heart murmur, and embolic events. Antibiotics should not be administered until 3 sets of blood cultures have been obtained. Earlier administration of antibiotic therapy is the most common reason for culture-negative endocarditis, and complicates diagnosis and therapy.

This case illustrates the importance of suspicion of infective endocarditis in all patients with systemic signs of inflammation.

Conflict of Interest

Nothing to disclose.

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