Aerococcus urinae Endocarditis: A Report of Two Cases and Review of Literature

Andrew Dysangco, M.D.*, Remedios F. Coronel, M.D.**, Julie Li-Yu, M.D.***, Francis Marie Purino M.D. ****, and Samuel Sunarso, M.D.*****

Abstract

Background: Aerococcus urinae is a rare pathogen of endocarditis with high rates of embolic events, valvular damage and mortality.

Case 1
A 24 y/o male, with mitral valve prolapse, presented with recurrent fever and body malaise for four months. $\alpha$-hemolytic streptococci was isolated in his blood 3 months prior, antibiotics for 10 days temporarily relieved his symptoms. He denied illicit drug use, recent dental, genitourinary manipulations. On admission, he was febrile with a 4/6 holosystolic murmur at the apex. He had leukocytosis and elevated acute phase reactants. Blood cultures: Aerococcus urinae. A TEE revealed: ruptured chordae and vegetation at the posterior mitral valve leaflet. Gentamicin for 14 days and Ceftriaxone for 28 days was completed. Mitral valve replacement was done and LV dimension returned to normal.

Case 2
A 51 y/o male presented with 9 days of fever, chills, and malaise. He was treated with norfloxacin with no relief of symptoms. On admission, he was febrile, with a grade 2/6 holosystolic murmur at the apex and left parasternal area. He had leukocytosis and blood culture grew Aerococcus urinae. Echocardiogram showed mitral stenosis, aortic stenosis and vegetations at the mitral valve and non coronary cusp. Pen-G plus Gentamicin for 14 days and upon discharge, amoxicillin for 2 weeks was completed.

Discussion: Risk factors associated with A. urinae endocarditis are >65 years of age, male, urologic abnormalities, malignancy and diabetes. Diagnosis is usually made by culture as our cases and both were found to have vegetations by echocardiography. B-lactam and amino glycoside treatment is effective and although mortality is high, both patients improved and were discharged.

Conclusion: A. urinae endocarditis does occur in a young population and to those without urologic abnormality.

Keywords: Endocarditis, Aerococcus urinae

Introduction

Aerococci are gram positive cocci that resemble staphylococci by morphology but have a biochemical and growth characteristics of streptococci and enterococci. They are catalase negative and form alpha-hemolytic colonies in blood agar. They are able to grow on 6.5% NaCl and form acid from glucose, sucrose, mannitol and maltose. Aerococcus urinae was initially described as a aerococcus-like organism by Colman et al and eventually was found out to differ from Aerococcus viridans by 16s rRNA sequencing. A. urinae has been reported to be a rare cause of urinary tract infection (UTI), accounting for 0.3-0.4%. Most infections reportedly occur in the elderly with anatomic or systemic risk factors such as diabetes mellitus, malignancy, urethral stricture or prostate hyperplasia. The genito-urinary tract is said to be the port of entry for this organism. It is also a rare cause of bacteremia and endocarditis which reportedly have a high mortality rate.7

Below are two cases of A. urinae endocarditis isolated from patients seen in the University of Santo Tomas Hospital (USTH).

Case Report

Case 1. A 24 year old male, married, marine engineer, who presented for a second opinion regarding mitral valve replacement. He has mitral valve prolapse and has recurrent fever and body malaise for four months. Three months prior, he consulted a physician and blood cultures isolated $\alpha$-hemolytic streptococci. He was given unrecalled antibiotics for 10 days with temporary relief of symptoms as fever then recurred intermittently. One month prior to consult, he was advised to have mitral valve replacement. On presentation at our institution a repeat 2D echocardiogram
showed posterior mitral valve leaflet prolapse and when compared to a previous echocardiogram, enlargement of LV from normal to 63mm. He was subsequently admitted for suspicion of infective endocarditis. He denied any illicit drug use, recent dental, genitourinary manipulations, and recurrent sore throat. He is non-hypertensive and non-diabetic.

He was febrile (T = 38.8°C), nontachycardic, nontachypneic and normotensive. There were neither Osler’s nodes nor splinter hemorrhages. He had clear breath sounds with a 4/6 holosystolic murmur at the 4th left intercostal space, mid-clavicular line. He had leukocytosis with elevated ESR of 17 mm after 1 hour, ASO 35.3 IU/mL, C-reactive protein = 27.9 mg/L, urinalysis was normal.

He was started on ampicillin-sulbactam 3gm/IV q 6h and gentamicin 240mg/IV OD. Blood cultures from 2 different sites grew Aerococcus urinae sensitive to Ceftriaxone, Clindamycin, Cefepime, Erythromycin, Chloramphenicol, Vancomycin. Ampicillin-Sulbactam was then shifted to Ceftriaxone 3gm/IV OD. A transthoracic echocardiography revealed: thickened anterior and posterior mitral valve leaflets, a mobile echodensity attached to the tip of the anterior mitral valve leaflet and non coronary cusp suggestive of vegetation. Antibiotics was shifted to Penicillin G 18 million units daily plus Gentamicin 180 mg daily as regimen for infective endocarditis. Erythrocyte sedimentation rate was 108mm/hour. Repeat blood cultures did not grow any organisms after ten days of therapy, and the erythrocyte sedimentation rate normalized. All antibiotics were completed for 14 days. He was discharged on amoxicillin 1500mg daily for another 2 weeks.

**Discussion**

These cases were the first two cases of Aerococcus urinae endocarditis reported from the USTH. The bacteriology lab uses the Vitek 60 semi automated system of identifying the organism.

It has been reported that the typical risk factors associated with A. urinae endocarditis include male sex, age of >65, and pre-existing urinary tract pathologies. Kass et. al, in their review of 14 cases, found that 85.7% (12/14) of the cases were males and 78.57% (11/14) were above the age of 65. In the same review there were 7 with urogenital pathology and only 2 out of the 14 were females. Ebnother et.al., reported 6 cases with UTI out of 11patients with A. urinae endocarditis. Like most of the reported cases, our cases were males. The first case has none of the other reported risk factors. He is in his mid 20’s and in our review; we have not found anyone as young. He does not have subjective nor objective evidence of urinary tract pathology. The second case was older, with history of urinary tract infection but did not have any evidence of systemic risk factors like diabetes or malignancy.

Except for the case reported by Ebnother et. al, where PCR was used, all reported cases of A. urinae endocarditis were confirmed by culture, including ours. Co-existing
Table I. Reported cases of Aerococcus urinae endocarditis in the literature.

<table>
<thead>
<tr>
<th>Source</th>
<th>Age</th>
<th>Gender</th>
<th>GU Tract Pathology</th>
<th>DM</th>
<th>Course</th>
<th>Antibiotic treatment</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>[1]</td>
<td>81</td>
<td>Y</td>
<td>Male</td>
<td>No</td>
<td>MI</td>
<td>B-lactam and AG</td>
<td>Died</td>
</tr>
<tr>
<td>[2]</td>
<td>75</td>
<td>Y</td>
<td>Male</td>
<td>No</td>
<td>Embolization, AVR</td>
<td>B-lactam and AG</td>
<td>Lived</td>
</tr>
<tr>
<td>[3]</td>
<td>89</td>
<td>Y</td>
<td>Male</td>
<td>No</td>
<td>Unspecified</td>
<td>B-lactam and AG</td>
<td>Died</td>
</tr>
<tr>
<td>[5]</td>
<td>68</td>
<td>Y</td>
<td>Male</td>
<td>Yes</td>
<td>Spondylitis</td>
<td>B-lactam and AG</td>
<td>Lived</td>
</tr>
<tr>
<td>[7]</td>
<td>77</td>
<td>Y</td>
<td>Male</td>
<td>No</td>
<td>Renal Failure</td>
<td>Vancomycin, β-lactam</td>
<td>Died</td>
</tr>
<tr>
<td>[8]</td>
<td>48</td>
<td>N</td>
<td>Male</td>
<td>No</td>
<td>Embolization</td>
<td>B-lactam and AG</td>
<td>Lived</td>
</tr>
<tr>
<td>[6]</td>
<td>79</td>
<td>Y</td>
<td>Female</td>
<td>Yes</td>
<td>CVA</td>
<td>B-lactam</td>
<td>Lived</td>
</tr>
<tr>
<td>[9]</td>
<td>81</td>
<td>Y</td>
<td>Male</td>
<td>No</td>
<td>MI, Embolization</td>
<td>B-lactam and AG</td>
<td>Died</td>
</tr>
<tr>
<td>[10]</td>
<td>73</td>
<td>Y</td>
<td>Male</td>
<td>No</td>
<td>Embolization</td>
<td>B-lactam and AG</td>
<td>Died</td>
</tr>
<tr>
<td>[10]</td>
<td>78</td>
<td>Y</td>
<td>Male</td>
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<td>Uneventful</td>
<td>Not available</td>
<td>Lived</td>
</tr>
<tr>
<td>[11]</td>
<td>55</td>
<td>N</td>
<td>Female</td>
<td>Yes</td>
<td>Cardiac failure</td>
<td>B-lactam and AG</td>
<td>Died</td>
</tr>
<tr>
<td>[12]</td>
<td>78</td>
<td>Y</td>
<td>Male</td>
<td>No</td>
<td>MI, Renal failure</td>
<td>B-lactam and AG</td>
<td>Died</td>
</tr>
<tr>
<td>[12]</td>
<td>43</td>
<td>N</td>
<td>Male</td>
<td>No</td>
<td>MI, embolization</td>
<td>B-lactam and AG</td>
<td>Died</td>
</tr>
<tr>
<td>[13]</td>
<td>69</td>
<td>Y</td>
<td>Male</td>
<td>No</td>
<td>AVR</td>
<td>B-lactam and AG</td>
<td>Lived</td>
</tr>
<tr>
<td>*</td>
<td>24</td>
<td>N</td>
<td>Male</td>
<td>No</td>
<td>MVR</td>
<td>Ceftriaxone and AG</td>
<td>Lived</td>
</tr>
<tr>
<td>*</td>
<td>55</td>
<td>N</td>
<td>Male</td>
<td>No</td>
<td>Uneventful</td>
<td>B-lactam and AG</td>
<td>Lived</td>
</tr>
</tbody>
</table>

GU, genitor-urinary; DM, diabetes mellitus; BPH, benign prostatic hyperplasia; TURP, Transurethral Resection of the Prostate; CVA, Cerebro-Vascular Accident; AVR, aortic valve replacement; MVR, mitral valve replacement; AG, aminoglycoside; *– our cases.

The clinical course was mostly complicated with vascular events such as embolization, myocardial infarction and CVA. 3 cases required replacement of a native valve. Almost all received β-lactam antibiotics mostly with aminoglycoside.

Our report suggests that although age and urologic pathology may be considered risk factors, Aerococcus urinae may in fact cause endocarditis in the younger population and those without urologic abnormality. Most of the cases were males and the clinical courses had various significant complications, notably embolic events. As new cases arise, a better picture of the disease and its epidemiology will be described and perhaps the mortality rate and complication rate would improve.

**Conclusion**

Aerococcus urinae causes endocarditis mainly in males with a high complication rate. This report provides evidence that Aerococcus urinae endocarditis does occur in younger population and to those without urologic abnormality. Further, we believe that the mortality rate may not be as high as reported, and more cases are needed in order to determine a more accurate mortality rate for the disease.

**References**


