CASE REPORT

A rare case of streptococcus mitis infective endocarditis complicated by heart failure in a lactating mother with recurrent breast engorgement

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Introduction

Infective endocarditis during breastfeeding is rare. To the best of the authors' knowledge, this is the second recorded case of infective endocarditis in a lactating mother. It is known that women of child-bearing age are susceptible to infective endocarditis during pregnancy when the immune system is compromised.[1] Nevertheless, past cases were also exposed to a systemic infection via milk infected by their infant's oral commensal. *Streptococcus mitis (S.Mitis)* endocarditis in pregnancy has also been reported, whereby a lady delivered via caesarean section and underwent mitral valve reconstruction and annuloplasty.[1] *S. mitis* is considered a pioneer streptococci commensal in human oral mucosa, appearing as early as 1-3 days after delivery.[2] As a child grows, their oral mucosa will be colonized by more *viridans streptococci*, including the teeth, oropharynx and nasopharynx. In a mother who breastfeeds, a crack in the nipple and breast engorgement can be predisposing factors for systemic infection stemming from an infant's oral commensal. Both cases of breastfeeding-related infective endocarditis caused by pioneer *streptococcus viridans, S.mitis* in our report and *S.salivarius*[3] in the previous report, affected the left-sided valves.

Case report

A 32-year-old Indonesian lady, Para 1, who has been working in a factory in Malaysia for the past 11 years presented with a 1-month history of fever, chills and rigors, lethargy and a productive cough with whitish phlegm. She had delivered a healthy, full-term baby girl 8 months ago via spontaneous vaginal delivery and had been breastfeeding the baby since birth. She reported intermittent breast engorgement with fever and was treated with antibiotics at the nearest clinic. She also complained of loss of appetite and the loss of approximately 5kg in weight over the past 4 months. Her past medical history was unremarkable. A physical examination revealed clubbing and splinter hemorrhages on her fingers and toes and hepatosplenomegaly. In addition, Janeway lesions were noted on both palms and soles. A cardiovascular examination showed raised jugular venous pressure, displaced apex beat, a pansystolic murmur which was loudest at the apex and radiated to the axilla and pedal edema up to the ankles. A Lung examination revealed bi-basal crepitations. A breast examination at this point was normal with no masses, nipple discharges or skin changes. An oral examination did not reveal any dental caries or oral candidiasis. Initial laboratory investigations showed bicytopenia (thrombocytopenia and microcytic hypochromic anemia), leucocytosis and microscopic hematuria. A working diagnosis of infective endocarditis complicated by heart failure was made. She was started initially on IV Ceftriaxone 2g OD.

Figure 1

Her transthoracic echocardiogram evinced an ejection fraction of 74% and dilated left and right atriums. There was moderate tricuspid regurgitation and severe mitral regurgitation with an eccentric jet. Large and fresh sessile vegetation was seen at the posterior mitral valve leaflet (2.5x1.5cm) (**yellow arrow in Figure 1**).

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Figure 2

An anteroposterior chest radiograph showed an upper lobe diversion and prominent perihilar vessels suggesting pulmonary edema. The left heart border was also straightened, suggesting a left atrial dilatation (**Figure 2)**.

The blood culture taken on admission grew Streptococcus mitis a few days later. It was sensitive to penicillin and ampicillin but resistant to clindamycin and erythromycin and had a minimal inhibitory concentration for penicillin of 0.032µg/l. The antibiotic was changed immediately to IV Benzylpenicillin 3MU every 4 hours and IV Gentamicin 3mg/kg OD, according to the local national antibiotic guidelines (National Antibiotic Guideline, 2014). No growth emerged from the subsequent blood cultures. The blood film for malarial parasites and sputum for Acid-fast bacilli were both negative. Her full blood picture did not show atypical cells.

With the administration of the antibiotics, the C-reactive protein decreased from 268.9 mg/L to 137.04 mg/L (normal range: < 3.0mg/L) within 3 weeks, while the Erythrocyte Sedimentation Rate (ESR) ranged from 84mm/hr to 113mm/hr (normal range : < 11mm/hr). An electrocardiogram done throughout the admission showed no prolonged P-R interval. After 3 weeks of antibiotics, she requested a discharge at her own risk with a plan for mitral valve replacement in her home country due to logistic issues.

Discussion

This is a case of prolonged fever with signs of infection, loss of weight, loss of appetite, signs of vasculitis and hepatosplenomegaly. Apart from the unifying diagnosis of infective endocarditis, other differential diagnoses could be pulmonary tuberculosis, myeloproliferative disease and connective tissue disease. Because the blood culture grew an organism typical of infective endocarditis, the other diagnoses were unlikely.

Streptococcus mitis (S. mitis) is a pioneer colonizer of the neonatal oropharynx and remains a significant commensal throughout life. In a past report of a breastfeeding mother with *S. salivarus endocarditis*, which was also the result of a viridans streptococci, it was suggested that the bacteria originated from the baby's flora and transmitted to the mother during breast engorgement.[3]

The pathogenesis behind *S. mitis* infective endocarditis is poorly understood. Several studies have shown that the bacteria is able to evade clearance via secretory Ig A, leading to adherence and colonization of the oral cavity. *S. mitis* then directly binds to platelets in the bloodstream as part of the pathogenesis of infective endocarditis.[4]

S. mitis has become an emerging threat for the immunocompromised, namely, neutropenic patients and the elderly.[4,5] This patient, albeit having just given birth 8 months prior, had, as far as we knew, an intact immune system and patent native heart valves. In an immunocompetent host, *S.Mitis* has a predilection for left-sided endocarditis in non-drug addicts and right-sided endocarditis in drug addicts[6].

The current management of infective endocarditis caused by oral streptococci, according to local guidelines and the European Society of Cardiology, remains a beta-lactam together with an aminoglycoside for a synergistic bactericidal effect and to shorten the duration of administration from 4 weeks to 2 weeks if the patient is on a beta-lactam alone.[7,8]

Duke's Criteria was used to diagnose infective endocarditis in this patient.[8,9] She fulfilled one major criteria, which was an oscillating intracardiac mass on the valve in the path of the regurgitant jets in an echocardiography, and four minor criteria, which were fever, vascular phenomena (Janeway lesions, splinter hemorrhages), immunologic phenomena (Osler nodes) and one positive blood culture of an organism consistent with infective endocarditis.

Conclusion

This case highlighted a rare complication of mastitis, i.e., infective endocarditis, possibly from the baby's oral commensal. Infective endocarditis during pregnancy and postpartum in Malaysia is rare, as we have effective dental screening for pregnant mothers with regular follow-up with a dentist throughout the pregnancy. However, some foreign workers and patients in rural areas attend antenatal follow-ups irregularly. Logistic issues, financial difficulties and poor education are the main barriers to maintaining their health.

As an influx of foreign workers is recognized as a health challenge for family physicians, the authors would like to suggest that education on dental screening, family planning and personal hygiene during breastfeeding should be provided to patients encountered during pregnancy.

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