CASE REPORT

Moraxella catarrhalis bacteraemia and prosthetic valve endocarditisLokesh Shahani,¹ Shahriar Tavakoli Tabasi²¹Department of Internal Medicine, Baylor College of Medicine, Houston, Texas, USA²Department of Medicine, Houston Veterans Hospital, Houston, Texas, USA

Correspondence to

Dr Lokesh Shahani,
lokesh83@hotmail.com

Accepted 8 October 2015

SUMMARY

Moraxella catarrhalis, once considered a non-pathogenic coloniser of the oropharynx, has now been recognised as a true pathogen and is reported in cases of bacteraemia. A 63-year-old man with an aortic bioprosthetic valve was brought to the emergency room with altered mental status. Initial blood cultures revealed Gram-negative diplococci on Gram stain; echocardiogram showed a 5 mm vegetation on the aortic bioprosthetic valve. The blood cultures grew *M. catarrhalis* and the patient was treated medically for prosthetic valve endocarditis with 6 weeks of ceftriaxone and had a favourable clinical outcome. *M. catarrhalis* has a high prevalence of β -lactamase production and hence the patient was treated with ceftriaxone. This case highlights the importance of considering *M. catarrhalis* as a pathogen in cases of invasive disease.

BACKGROUND

Moraxella catarrhalis had for long been regarded as a non-pathogenic coloniser of the oropharynx, and was estimated to colonise the oropharynx of around 1–5% of the adult population.^{1–2} Over the past two decades it has been recognised as a commensal of the respiratory tract in children and in adults with underlying lung disease, and a common pathogen in respiratory exacerbations;^{1–3} however, cases of invasive disease with this pathogen are scant in the literature.^{3–7} We report a case of *M. catarrhalis* bacteraemia and prosthetic valve endocarditis.

CASE PRESENTATION

A 63-year-old man with a history of ischaemic cardiomyopathy, who had been fitted with a biventricular pacemaker and a bioprosthetic aortic valve due to previous infective endocarditis secondary to *Streptococcus gallolyticus* bacteraemia, presented at the emergency room, with altered mental status. The patient had been having symptoms of confusion and lethargy, and had been falling frequently, over the past 4 days. Symptoms such as chest discomfort, palpitations, cough, dyspnoea, skin lesion and fever were denied by the patient. The patient was unemployed and had a significant history of alcohol consumption. He denied smoking and illicit drug use. No apparent portal of entry for bacteraemia, such as recent surgical and medical indwelling prosthetic devices (including intravascular catheters, orthopaedic hardware) were identified.

On examination, the patient was tachycardic with a heart rate of 96 bpm, with the remainder of his vital signs within normal limits (temperature

37.4°C, respiratory rate 13/min, blood pressure 116/72 mm Hg). He was poorly nourished and lethargic on examination. On cardiovascular examination, the patient was tachycardic, however, no murmurs, rubs or gallops were appreciated. The remainder of his physical examination was unremarkable.

INVESTIGATIONS

Initial laboratory examination revealed macrocytic anaemia (haemoglobin 9.8 g/dL and mean corpuscular volume 108 fL), normal white cell count (WCC) and differential (5600 cells/ μ L), elevated C reactive protein (3.6 mg/L) and hypoalbuminaemia (2.4 g/dL). An initial CAT scan with contrast did not show any intracranial bleed or lesions. Blood cultures were drawn on presentation, which revealed Gram-negative diplococci on the initial Gram stain.

DIFFERENTIAL DIAGNOSIS

At this time, the differential diagnosis included *Neisseria* spp along with *Moraxella* and *Kingella* spp. With concerns for meningitis, the patient underwent a lumbar puncture, however, the cerebrospinal fluid (CSF) was non-inflammatory (0 WCC/mm³ and normal proteins and glucose) and the CSF Gram stain was negative. Further, with the concerns for endocarditis with some *Neisseria* spp as well as *Moraxella* and *Kingella* spp, the patient underwent a transthoracic echocardiogram followed by transoesophageal echocardiography, which showed a 5 mm vegetation on the aortic bioprosthetic valve.

TREATMENT

The patient was started on ceftriaxone 2 g intravenously daily, based on the American Heart Association guidelines,⁸ while waiting for the blood cultures to finalise. The blood cultures grew *M. catarrhalis* from both the aerobic bottles on the third day of incubation and the organism was confirmed to be a β -lactamase-producing species. The patient was treated medically for prosthetic valve endocarditis with 6 weeks of ceftriaxone and had a favourable clinical outcome. The patient was evaluated with a transthoracic echocardiogram near the time of completion of antibiotics; he was found to have calcification and reduction in the size of the vegetation.

DISCUSSION

We report a case of a patient presenting with *M. catarrhalis* bacteraemia and found to have

CrossMark

To cite: Shahani L, Tavakoli Tabasi S. *BMJ Case Rep* Published online: [please include Day Month Year] doi:10.1136/bcr-2014-207368

prosthetic valve endocarditis. The patient did not have any predisposing factors for *Moraxella* bacteraemia and there was no point of entry for the organism. Previous case series have described cases with *Moraxella* bacteraemia and invasive disease.^{3–5} Concurrent respiratory illness was associated with 48–54% of these patients with bacteraemia. However, in the other half of patients, no point of entry for the organism could be identified. Around two-thirds of the reported patients in both case series were predisposed due to an immunocompromised state or an underlying respiratory disease; however, 28–36% of the patients did not have any predisposing condition. There were five reported patients with endocarditis in these two case series and four died, giving a crude mortality rate of 80%, which was significantly greater than the patients with bacteraemia alone (21%).

Among the seven previously published cases of endocarditis secondary to *M. catarrhalis* bacteraemia,^{3–7} there was only one reported patient with a prosthetic valve endocarditis with *M. catarrhalis* bacteraemia.⁶ The previously reported patient with prosthetic valve endocarditis due to *M. catarrhalis* bacteraemia had presented with generalised weakness and was diagnosed with endocarditis. This particular patient had

recurrent embolic phenomena and developed peri-valvular abscess and, despite surgical intervention, had a negative outcome. This case further highlights the pathogenicity of *M. catarrhalis* in cases of prosthetic valve endocarditis.

M. catarrhalis rapidly acquired β -lactamases in the 1970s and 1980s; susceptibility patterns have remained relatively stable since then.⁹ Currently, >90% of the strains produce β -lactamases and are resistant to ampicillin.¹⁰ The reported patient also had a β -lactamase-producing species, and hence was treated with ceftriaxone. This case highlights the importance of considering *M. catarrhalis* as a pathogen and bearing its potential to cause invasive disease in mind.

Competing interests None declared.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

REFERENCES

- 1 Vanechoutte M, Verschraegen G, Claeys G, *et al.* Respiratory tract carrier rates of *Moraxella* (Branhamella) *catarrhalis* in adults and children and interpretation of the isolation of *M. catarrhalis* from sputum. *J Clin Microbiol* 1990;28:2674.
- 2 Ejlersen T, Thisted E, Ebbesen F, *et al.* Branhamella *catarrhalis* in children and adults. A study of prevalence, time of colonisation, and association with upper and lower respiratory tract infections. *J Infect* 1994;29:23–31.
- 3 Tolentino LF. Causes of *Moraxella Catarrhalis* pathogenicity: review of literature and hospital epidemiology. *Lab Med* 2007;38:420–1.
- 4 Ioannidis JPA, Worthington M, Griffiths JK, *et al.* Spectrum and significance of bacteremia due to *Moraxella catarrhalis*. *Clin Infect Dis* 1995;21:390–7.
- 5 Þórsson B, Haraldsdóttir V, Kristjánsson M. *Moraxella catarrhalis* bacteraemia. A report on 3 cases and a review of the literature. *Scand J Infect Dis* 1998;30:105–9.
- 6 Pollock AA, Holzman RS. *Neisseria catarrhalis* endocarditis. *Ann Intern Med* 1976;85:206–7.
- 7 Stefanou J, Agelopoulou AV, Sipsas NV, *et al.* *Moraxella catarrhalis* endocarditis: case report and review of the literature. *Scand J Infect Dis* 2000;32:217–18.
- 8 Baddour LM, Wilson WR, Bayer AS, *et al.* Infective endocarditis: diagnosis, antimicrobial therapy, and management of complications: a statement for healthcare professionals from the Committee on Rheumatic Fever, Endocarditis, and Kawasaki Disease, Council on Cardiovascular Disease in the Young, and the Councils on Clinical Cardiology, Stroke, and Cardiovascular Surgery and Anesthesia, American Heart Association: Endorsed by the Infectious Diseases Society of America. *Circulation* 2005;111:e394–433.
- 9 Nissinen A, Grönroos P, Huovinen P, *et al.* Development of beta-lactamase-mediated resistance to penicillin in middle-ear isolates of *Moraxella catarrhalis* in Finnish children, 1978–1993. *Clin Infect Dis* 1995;21:1193–6.
- 10 Deshpande LM, Sader HS, Fritsche TR, *et al.* Contemporary prevalence of BRO beta-lactamases in *Moraxella catarrhalis*: report from the SENTRY antimicrobial surveillance program (North America, 1997 to 2004). *J Clin Microbiol* 2006;44:3775–7.

Learning points

- *Moraxella catarrhalis* had for long been regarded as a non-pathogenic coloniser of the oropharynx, however, recently, it has been reported to be a true pathogen and responsible for cases of bacteraemia.
- Endocarditis is an unusual manifestation in patients with *M. catarrhalis* bacteraemia, however, it needs to be considered due to worse prognosis in undiagnosed cases.
- In case series describing *Moraxella* bacteraemia and invasive disease, in about half of the patients no point of entry for the organism could be identified and in around one-third of the patients, the predisposing condition was identified.
- Currently, >90% of the strains produce β -lactamases and, if *M. catarrhalis* is suspected, empiric therapy with ceftriaxone should be considered.

Copyright 2015 BMJ Publishing Group. All rights reserved. For permission to reuse any of this content visit <http://group.bmj.com/group/rights-licensing/permissions>.
BMJ Case Report Fellows may re-use this article for personal use and teaching without any further permission.

Become a Fellow of BMJ Case Reports today and you can:

- Submit as many cases as you like
- Enjoy fast sympathetic peer review and rapid publication of accepted articles
- Access all the published articles
- Re-use any of the published material for personal use and teaching without further permission

For information on Institutional Fellowships contact consortiasales@bmjgroup.com

Visit casereports.bmj.com for more articles like this and to become a Fellow