Penicillin-sensitive *Moraxella* prosthetic endocarditis

Near disaster caused by failure to treat with penicillin

W CHEN, P K LEE, P Y CHAU

From the Departments of Medicine and Microbiology, Queen Mary Hospital, University of Hong Kong

SUMMARY A patient with late prosthetic endocarditis resulting from *Moraxella non-liquefaciens* is reported. Correct laboratory identification is of therapeutic importance as *Moraxella* is often highly sensitive to penicillin. Because of suspected penicillin sensitivity, antibiotics other than penicillin were used, but failed to control the endocarditis. Prompt response occurred when penicillin was given. Penicillin remains by far the most effective antibiotic for the treatment of endocarditis, particularly when affecting prosthetic valves, and caused by organisms sensitive to penicillin.

Penicillin remains the most effective antibiotic in the treatment of infective endocarditis caused by organisms sensitive to penicillin. In this case report, the near disaster caused by withholding penicillin and the prompt response to penicillin is described in a patient with late prosthetic valve endocarditis caused by *Moraxella non-liquefaciens*.

Case report

A 32-year-old housewife was admitted to the University Medical Unit, Queen Mary Hospital, in February 1980. She had rheumatic mitral stenosis, mitral regurgitation, and aortic regurgitation diagnosed in 1960. Skin test for penicillin sensitivity using intradermal injection of penicillin was positive, with the formation of a large wheal measuring 5 cm in diameter. It was considered that the patient was sensitive to penicillin, and sulphadiazine was given for prophylaxis. In November 1972, she underwent double valve replacement. A Björk-Shiley valve was inserted in the mitral position and a Starr-Edwards valve (model 1260) in the aortic position. In February 1980 she was admitted because of pyrexia, chills, and rigor. Examination showed a temperature of 39.1°C. There was no clubbing, Osler's node, petechiae, splinter haemorrhage, or mucosal haemorrhage. She was in atrial fibrillation with a ventricular rate of 100 per minute. Blood pressure was 120/80 mmHg. On auscultation of the heart, the prosthetic sounds were normal. There was a diastolic rumbling murmur at the apex and an ejection systolic murmur at the aortic area. The spleen tip was palpable. Fundal examination was normal. Investigations showed a haemoglobin level of 11.9 g/100 ml and a blood leucocyte count

of 12 500 per mm³, with 70% polymorphs. Erythrocyte sedimentation rate was 43 mm in the first hour. Urinalysis and renal function tests were normal. Electrocardiogram showed atrial fibrillation. Chest x-ray film showed cardiomegaly. Normal prosthetic valve movements were shown on fluoroscopy. Both M-mode and two dimensional echocardiograms failed to demonstrate vegetations. On the third hospital day, she was started on streptomycin 0.5 g intramuscularly every twelve hours and cephalothin 2 g intravenously every six hours. Six days later, the preliminary report of the blood cultures indicated growth of "*Alcaligenes species*", sensitive to ampicillin, carbenicillin, cephamandole, kanamycin, gentamicin, tetracycline, and co-trimoxazole. She still had a pyrexia ranging from 37.2°C to 38.3°C. Cultures of urine, sputum, faeces, and throat swab were negative. Repeated erythrocyte sedimentation rate was 92 mm in the first hour. There was microscopical haematuria. Rheumatoid factor and antinuclear factor were negative. C3 level was 130 mg/100 ml (normal 86 to 184 mg/100 ml) and C4 level 36 mg/100 ml (normal 24 to 80 mg/100 ml). Cephalothin and streptomycin were discontinued and she was given gentamicin 60 mg intramuscularly every eight hours. The fever still persisted after ten days of gentamicin, which was stopped on the 18th hospital day. The "*Alcaligenes species*" isolated from the blood was later identified to be *Moraxella non-liquefaciens* according to tests recommended by Cowan.¹ It was highly sensitive to penicillin, the minimal inhibitory and bactericidal concentrations being 0.25 and 1.0 units/ml, respectively. Penicillin was withheld in view of her previous history of suspected penicillin sensitivity. On the 27th hospital day, the temperature rose to 40°C and she was

given cephmandole 1 g intravenously every six hours. As fever persisted, she was given penicillin by intravenous infusion, 10 megaunits daily. After two days the fever subsided. She remained afebrile and the soluble penicillin was continued for six weeks. On the 42nd hospital day she developed cerebral embolism resulting in transient left hemiparesis. When last seen four months after discharge, the spleen was not palpable and her erythrocyte sedimentation rate was 20 mm in the first hour.

Discussion

Our patient illustrates two important points. Firstly, moraxella is an unusual causative organism of infective endocarditis. It had been reported to affect natural valves.²⁻⁴ We believe that our patient is the first reported case of prosthetic valve endocarditis caused by moraxella. Recognition of this is of clinical importance as moraxella is often highly sensitive to antibiotics,⁵ whereas other Gram negative enteric bacteria, which moraxella may be mistaken for, are not. Secondly our patient shows that despite the discovery of numerous new potent antibiotics, penicillin remains the best antibiotic for treating infective endocarditis caused by penicillin-sensitive organisms. This should be used whenever possible. In our patient, other antibiotics were initially tried because of the positive skin test to penicillin. The test had been performed in 1960, when it was done routinely in our department in all patients before they received penicillin. This is no longer a practice because of the various limitations of the test.⁶ None the less, amino-

glycosides and cephalosporins were given initially as the *Moraxella non-liquefaciens* isolated was found to be sensitive to them. Despite the laboratory findings, however, these antibiotics failed to control the endocarditis. With the institution of penicillin, clinical response occurred promptly and complete cure resulted after treatment for six weeks. This was in pronounced contrast to the near disaster when other antibiotics were used, illustrating the importance of using penicillin, whenever possible, in treating infective endocarditis caused by penicillin-sensitive organisms.

References

- 1 Cowan ST. *Cowan and Steel's manual for the identification of medical bacteria*. 2nd ed. London: Cambridge University Press, 1974: 87.
- 2 Christensen CE, Emmanouilides GC. Bacterial endocarditis due to "Moraxella New Species I". *N Engl J Med* 1967; 227: 803-4.
- 3 Silberfarb PM, Lawe JE. Endocarditis due to *Moraxella non-liquefaciens*. *Arch Intern Med* 1968; 122: 512-3.
- 4 Schnurr LP, Ball AP, Geddes AM, Gray J, McGhie D. Bacterial endocarditis in England in the 1970's. A review of 70 patients. *Q J Med* 1977; 46: 499-512.
- 5 Pedersen MM, Marso E, Pickett MJ. Nonfermentative Bacilli associated with man: III Pathogenicity and antibiotic susceptibility. *Am J Clin Pathol* 1970; 54: 178-92.
- 6 Levine BB, Zolov DM. Prediction of penicillin allergy by immunological tests. *J Allergy* 1969; 43: 231-44.

Requests for reprints to Dr W Chen, University Department of Medicine, Queen Mary Hospital, Hong Kong.