CASE REPORT

INVASIVE *ERYSIPELOTHRIX RHUSIOPATHIAE* INFECTION IN NORTHEAST THAILAND

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Abstract. Three cases of invasive *Erysipelothrix rhusipathiae* infection, which is considered rare, presented to a hospital in Ubon Ratchathani, northeast Thailand during 2006. Patients presented with variable clinical manifestations including diffused cutaneous lesions, bacteremia and endocarditis. *Erysipelothrix* infection may be an emerging infection in immunocompromized individuals in Thailand.

INTRODUCTION

Erysipelothrix rhusiopathiae, a facultative anaerobic gram-positive bacillus, primarily causes disease of animals, including swine, sheep, cattle, horses, chicken, dogs and fish (Reboli and Farrar, 1989). The route of infection for humans is most commonly skin scratches or puncture wounds that occur whilst handling infected animal material; those at highest risk are farmers, butchers, fishermen and fish handlers. The most common manifestation of human disease is erysipeloid, a cutaneous infection which can heal without antimicrobial treatment (Nelson, 1955). Other rare but serious manifestations are bacteremia and endocarditis (Gorby and Peacock, 1988). Here, we report 3 patients with invasive *E. rhusiopathiae* infection presenting to Sappasithiprasong Hospital, Ubon Ratchathani, northeast Thailand during 2006.

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CASE REPORTS

Case 1

A 44-year-old male rice farmer with alcoholic cirrhosis presented with a 2-week history of cough and productive sputum and a 4-day history of fever with increasing breathlessness. On examination he had a temperature of 39.8ºC, respiratory rate of 24/minute, a diastolic murmur in the aortic valve area and right lung crepitations. Laboratory tests showed a leukocyte count of 6.5 x 10^9/l and a platelet count of 163 x 10^9/l. Chest radiography showed right middle lobe consolidation and cardiomegaly. Parenteral ceftazidime was prescribed. An echocardiography performed on the day of admission demonstrated an 11 x 8 mm vegetation at the right coronary cusp of the aortic value and severe aortic regurgitation, after which intravenous penicillin was added. The patient responded well and became afebrile within 24 hours. Three days

later, two blood cultures taken on the day of admission became positive for *E. rhusiopathiae*. Ceftazidime was stopped and penicillin continued. On day 21, the patient developed a fever of 39ºC associated with hypotension (blood pressure 70/40 mmHg), a severe metabolic acidosis (pH 7.02, bicarbonate 9.4 mmol/l) and a leukocyte count of 1.4 x 10^9/l, at which point ceftazidime was resumed. The patient died two days later from septic shock. Blood and urine culture taken on the day of his deterioration grew the same strain of *Escherichia coli.*

Case 2

A 50 year-old-female rice farmer with nephrotic syndrome and diabetes mellitus treated with pulsed methyl prednisolone every 2 months presented 2 weeks after the second dose with a 1-day history of fever, chills and a productive cough. On admission she had a temperature of 36.8ºC, respiratory rate of 20/minute, pulse rate 70/minute, and blood pressure of 140/90 mmHg. Breath and heart sounds were normal. Laboratory tests showed a leukocyte count of 11.0 x 10^9/l and a platelet count of 162 x 10^9/l. Parenteral ceftazidime was commenced. She markedly improved and was discharged within 24 hours with clarithromycin for 5 days. Two days later, one blood culture taken on the day of admission grew *E. rhusiopathiae*. The patient was asymptomatic on outpatient review 2 weeks later. No further antibiotics were prescribed, and she remained well three months later.

Case 3

A 42-year-old female housewife with end stage renal disease on chronic hemodialysis presented with a 3-day history of fever, chills and diffuse erythematous lesions on both lower limbs. One week earlier, the patient had noted a small pustule at her right palm which healed without treatment. On examination she had a temperature of 39ºC and respiratory rate of 24/minute. Parenteral cefazolin and ceftazidime were prescribed. Three days later, two blood cultures taken on the day of admission became positive for *E. rhusiopathiae*. On day 7, she suffered a cardiac arrest and died, the cause of which was not determined.

DISCUSSION

Two previous cases of invasive *Erysipelothrix* infection occurring in Thailand have been reported in the literature (Tanomsup *et al*, 1987; Totemchokchyakarn *et al*, 1996). Although *E. rhusiopathiae* bacteremia or endocarditis is considered rare, we report three cases of invasive *E. rhusiopathiae* infection presenting to one hospital in northeast Thailand during 2006. All isolates were confirmed as *E. rhusiopathiae* by the Department of Medical Science, Ministry of Public Health, Thailand.

E. rhusiopathiae is ubiquitous in the environment and is a commensal or pathogen of many animal species, the major reservoir being swine. It is also found in association with fish where it survives in their mucoid slime. Specific occupations that lead to exposure to animals, and conditions that affect the host immune response (in particular, cirrhosis and alcoholism), are well-known risk factors for invasive *E. rhusipathiae* infection (Gorby and Peacock, 1988). Chronic kidney disease, diabetes mellitus, cancer and steroid use have also been reported as underlying medical conditions (Ognibene *et al*, 1985; Garcia-Restoy *et al*, 1991; Totemchokchyakarn *et al*, 1996; Dunbar and Clarridge, 2000; Simionescu *et al*, 2003).

Manifestations of *E. rhusiopathiae* infection can be categorized into cutaneous lesions and invasive disease. Cutaneous lesions may be localized (painful, well-defined, erythematous swelling with discoloration of the central area), or diffuse (multiple hemorrhagic rhombic purpura with bullous or hemorrhagic

vescicles and central healing); diffuse cutaneous lesions are commonly associated with invasive infection (Garcia-Restoy *et al*, 1991; Totemchokchyakarn *et al*, 1996). Invasive infections commonly present as bacteremia, endocarditis or septic arthritis. Endocarditis most commonly affects native, left-sided heart valves and has an associated mortality of 38% (Gorby and Peacock, 1988). Bacteremia in the absence of endocarditis is clearly recognized (Shumak *et al*, 1987; Garcia-Restoy *et al*, 1991; Fakoya *et al*, 1995; Totemchokchyakarn *et al*, 1996), but careful cardiac examination including echocardiogram should be performed in all patients with positive blood cultures. Septic arthritis may occur in previously normal or damaged joints (Dunbar and Clarridge, 2000; Allianatos *et al*, 2003; Wong *et al*, 2003), and typically presents as a chronic monoarthritis affecting large joints such as the knee or elbow.

Diagnosis of *E. rhusiopathiae* infection is made by culture of the organism. On Gram stain, the organism is a gram-positive rod arranged singly, in pairs in a "V" configuration, or in short chains. The organism is α-hemolytic on blood agar and catalase-negative, and is typically positive for hydrogen sulfide production on triple-sugar iron medium, positive for PYR hydrolysis and resistant to vancomycin. *E. rhusiopathiae* is typically susceptible to penicillin, erythromycin, ceftriaxone, and ciprofloxacin, with low minimum inhibitory concentrations (MICs) (MIC_{90} 0.03 mg/l, 0.125 mg/l, 0.125 mg/l and 0.06 mg/l, respectively) (Fidalgo *et al*, 2002). Antimicrobial treatment of invasive infection is parenteral penicillin 12 to 20 million units/day given for 4 to 6 weeks for endocarditis, and 2 to 4 weeks in other invasive infections. Valve replacement is required in one third of endocarditis patients (Gorby and Peacock, 1988). The validity of alternative regimens for the treatment of invasive infection, including the use cephalosporins, ciprofloxacin, and short duration parenteral penicillin followed by 4 to 6 weeks of oral therapy, is unclear since the number of patients reported to have been thus treated are small (Ognibene *et al*, 1985; Shumak *et al*, 1987; Reboli and Farrar, 1989; Garcia-Restoy *et al*, 1991; Totemchokchyakarn *et al*, 1996). *E. rhusiopathiae* is susceptible to clarithromycin (Soriano *et al*, 1998) (and was used in case 2), but there is no evidence base to support this. Skin infection can be treated with a one week course of oral amoxicillin.

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