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Pittsburgh pneumonia agent and legionellosis in Nottingham

Pittsburgh pneumonia agent, tentatively named *Legionella micdadei*, reportedly causes severe pneumonia in immunocompromised patients.^{1,2} We report the first case of *L. micdadei* pneumonia outside North America, in which the patient responded to ampicillin and amoxycillin.

Case report

A 68-year-old man was admitted to the City hospital on 5 February 1981 with a two-day history of fever, rigors, sweating, sore throat, dyspnoea, unproductive cough, and right pleural pain. He had smoked for many years and suffered from chronic bronchitis. He was otherwise well and had not been away from Nottingham recently.

On examination he was alert, his temperature was 38°C and pulse 110 beats/minute. There were widespread crepitations at the right lung base. His liver was tender but not enlarged. Sputum, obtained only after trans-tracheal saline injection, was mucopurulent. White cell count was $8.0 \times 10^9/l$ (81% neutrophils, 14% lymphocytes, 5% monocytes). Cold agglutinin screening test was negative. Packed cell volume and serum electrolyte, calcium, and haemoglobin concentrations were normal, though urea and creatinine concentrations were raised initially. Urine testing showed no abnormality. Liver function values were normal apart from a serum alkaline phosphatase activity (liver origin) of 210 IU/l, which later rose to 430 IU/l (normal 46-190). Blood cultures were sterile. Sputum was cultured for common respiratory pathogens, mycobacteria, *L. pneumophila*, and *Mycoplasma pneumoniae* without success. Sputum smears tested with *L. micdadei* antiserum by the indirect fluorescent antibody technique were negative. A throat swab yielded herpes simplex virus. He later developed herpes labialis. Tests on sequential serum samples showed no change in complement fixation titres to common viral and other respiratory pathogens. Legionella indirect fluorescent antibody tests on the same serum samples were done by the set method with formalised yolk-sac antigens³ prepared from strains of *L. pneumophila* serogroups 1-6, *L. bozemanii*, *L. dumoffii*, *L. micdadei*, and *L. gormanii*. All strains had been checked against specific antisera and by gas-liquid chromatography. The sera showed a diagnostic rise in antibody titre to *L. micdadei* antigen only (table). Serum from his wife was negative. Chest radiography showed alveolar shadowing throughout the right lung and generalised emphysema.

Results of indirect fluorescent antibody testing expressed as reciprocal titre

Days after start of illness	<i>L. micdadei</i>			<i>L. pneumophila</i> * (Antihuman globulin)	<i>L. bozemanii</i> , <i>L. dumoffii</i> , <i>L. gormanii</i> (Antihuman globulin)	<i>M. pneumoniae</i>		
	Antihuman globulin	IgG	IgM			IgM	IgG	IgA
3	32	16	±16	<16	<16	<4	8	<4
8	32	16	±16	<16	<16	<4	≥8	<4
30	512	64	16	<16	<16	<4	≥8	<4
58	512	128	32	<16	<16	—	—	—
86	512	128	±16	<16	<16	—	—	—
149	128	64	±16	<16	<16	—	—	—

*Serotypes 1-6 tested separately. †Tested separately.

The patient was treated with ampicillin 500 mg six-hourly intravenously for two days, followed by oral amoxycillin 2 g/day for seven days. He improved, became afebrile within 36 hours, and left hospital after seven days. A week later fever, rigors, right pleuritic pain, and cough recurred and he took to his bed. Amoxycillin (750 mg/day) was given for seven days, and he improved and felt almost normal a month after his original admission. The radiological shadowing resolved over three months. Lung function values at that stage showed airflow obstruction with forced expiratory volume in one second 0.8 l and forced vital capacity 2.0 l.

Comment

Legionnaires' disease has been recognised as a cause of community-acquired and nosocomial pneumonia since 1976.⁴ Over the past 11 months all adults admitted to this hospital with primary pneumonia have been fully investigated. Of 124 consecutive patients, 11 (9%) cases of *L. pneumophila* infection (all serogroup 1) were diagnosed. None was fatal. In addition we report a case of pneumonia due to *L. micdadei*, which has previously been associated with infection in immunocompromised patients² and one other patient with chronic obstructive lung disease.⁵ Our patient had none of the characteristic features of legionnaires' disease.

Several legionella-like organisms are now recognised.⁴ The PPA, TATLOCK, and HEBA strains now included within *L. micdadei* species differ from *L. bozemanii* (WIGA) and *L. dumoffii* (TEX-KL). Unlike *L. pneumophila* and *L. bozemanii*, *L. micdadei* does not produce beta-lactamase⁴ and is susceptible to penicillin in vitro. Experience in vivo is difficult to interpret because of multiple antibiotic usage.^{1,2,5} Our patient initially responded well to ampicillin and amoxycillin, but subsequently relapsed. He improved again after additional amoxycillin. This suggests that *L. micdadei* pneumonia responds to ampicillin, though prolonged treatment may be necessary.

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