**CASE REPORT**

**Pneumocystis carinii** pneumonia with pleurisy, platypnoea and orthodeoxia

P N Newton, A E Wakefield*, R Goldin, J Govan

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We present a patient who collapsed with chest pain and dyspnoea on a transatlantic flight. She was found to have *Pneumocystis carinii* pneumonia (PCP) and human immunodeficiency virus infection. Platypnoea and orthodeoxia, which have not been previously reported in association with PCP, were major features of her illness. The PCP predominantly affected her lung bases and it is likely that gravity increased intrapulmonary blood flow through poorly ventilated lung bases with failure of pulmonary vasoconstriction to increase upper zone perfusion, exacerbating desaturation on sitting up. The partial DNA sequence of the infecting *P carinii* was identical to previously described isolates.

**CASE HISTORY**

A 45 year old white housewife collapsed on a transatlantic flight with sudden onset retrosternal pleuritic chest pain, severe dyspnoea, and a cough which was unproductive apart from haemoptysis. She had never smoked and had spent the preceding 6 months visiting relatives in northeastern USA where, over the previous 4 months, she had developed wheeze, mild dyspnoea, and worsening intermittent pleuritic chest pain. She had no history of blood transfusions or intravenous drug use but had spent one flight with sudden onset retrosternal pleuritic chest pain, and haemoptysis on a flight with arterial hypoxia (platypnoea) and was consistently coupled with a fall in her oxygen saturation (orthodeoxia). On day 11 she deteriorated with fever and dyspnoea and died on day 31 despite treatment with clindamycin, methylprednisolone, atovaquone and empirical ganciclovir, *Mycobacterium tuberculosis* therapy, fosfomycin, imipenem, itraconazole, and ventilation.

At necropsy large numbers of *P carinii* cysts were identified throughout the alveoli of both lungs by methanamine silver staining. There was mild chronic inflammation of the pleura but no organisms were identified in the pleura or other organs. No evidence for pulmonary emboli, ARDS, or deep venous thrombosis was found. The DNA extracted from the induced sputum sample was amplified using primers designed to the internal transcribed spacer regions of the *P carinii* nuclear rRNA operon. The DNA sequence was identical to one of the previously described sequences (B1d).

**DISCUSSION**

The PCR technique allowed the diagnosis of *P carinii* pneumonia in a situation difficult for conventional methods. The *P carinii* DNA detected might have been derived from the oropharynx rather than from the lungs, and throat samples instead of induced sputum might have sufficed. Dyspnoea and oxygen desaturation exacerbated by sitting upright—platypnoea and orthodeoxia, respectively—were the patient’s most striking clinical features. They have not been previously reported in association with PCP. Investigations gave no evidence that previously reported causes of this syndrome—particularly intracardiac or intrapulmonary anatomical shunts, pericardial effusions, or constriction or emphysema—were responsible.

The initial diagnosis of acute pulmonary emboli was suggested by the history of sudden collapse with dyspnoea, chest pain, and haemoptysis on a flight with arterial hypoxia and electrocardiographic S1Q3T3 without any evidence for sepsis. The S1Q3T3 pattern is a well known associate of pulmonary vein thromboembolism.}

*Deceased*
emboli with very low sensitivity (16%) but high specificity (93%). Pulmonary angiography suggested that she had had pulmonary emboli, probably before the presenting illness. The absence of significant large emboli on pulmonary angiography some 16 hours after collapse, with continuation of her symptoms and signs for 31 days, argues against emboli being the main cause of the patient's pleurisy and platypnoea. Platypnoea and orthodexia probably arose as gravity increased intrapulmonary blood flow shunting through poorly ventilated damaged lung bases, with failure of pulmonary vasoconstriction to increase upper zone perfusion exacerbating dyspnoea and desaturation while sitting up. Indeed, the computed tomographic scan suggested that the lung bases were predominantly affected by the PCP. The analysis of two different genetic loci suggested that the isolate of \textit{P carinii} infecting this patient was not substantially different from previously described isolates, despite the atypical clinical presentation.

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