

## Case reports

# Fatal chickenpox pneumonia in an asthmatic patient on oral steroids and methotrexate

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### Abstract

**A 49 year old man with a long history of severe chronic asthma, treated with oral corticosteroids and weekly doses of methotrexate, contracted chickenpox from his son whose chickenpox rash had developed three weeks before presentation. Five days before admission the patient developed a vesicular skin rash which became extensive, with general malaise, bilateral pneumonia, and acute deterioration of his asthma. He died two weeks after admission despite treatment with acyclovir.**

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Varicella (chickenpox) is a common contagious disease in childhood but is uncommon in adults, although its incidence is increasing.<sup>1</sup> It

tends to be more severe in adults. Pneumonia occurs frequently and is the principal mechanism of death, with smokers being at particular risk.<sup>1,2</sup> The role of the antiviral treatment, acyclovir, is not clear. Esmond *et al*, in a retrospective analysis, suggested that it had no benefit,<sup>3</sup> whilst others have found it of value in previously healthy adults<sup>4</sup> and in association with pregnancy.<sup>5</sup> In immunocompromised patients there has been no change in the proportion of those with chickenpox who die since the introduction of acyclovir.<sup>1</sup> We report a case of varicella pneumonia in an asthmatic patient treated with methotrexate and corticosteroids.

### Case report

A 49 year old man, a recent ex-smoker who had suffered from asthma since childhood, had required oral maintenance corticosteroids for the previous eight years. His asthma had progressively worsened, with frequent exacerbations which required increases in his maintenance dose of 10 mg prednisolone, with the development of spinal osteopenia. He had been admitted with exacerbations eight and six months before presentation. During the second admission he was started on methotrexate, 15 mg weekly. Apart from one exacerbation requiring admission two months later, his asthma was better controlled on 10 mg prednisolone, his peak flow being close to his best of 350 l/min.

After six months on methotrexate he was admitted with a five day history of a progressive vesicular rash associated with increasing general malaise and breathlessness. His son had developed chickenpox three weeks before the onset. On examination the maculovesicular rash was noted, he was ill with a temperature of 36.8°C, pulse rate of 112, and a respiratory rate of 20 breaths/min. There were rhonchi throughout both lung fields but no signs of consolidation. Chest radiography showed generalised shadowing with a tendency to a nodular pattern and more confluent changes at the right base (fig 1). Breathing air, his arterial Pao<sub>2</sub> was 6.1 kPa and Paco<sub>2</sub> was 3.3 kPa, haemoglobin was 16.7 g/dl, white cell count 5.4 × 10<sup>9</sup>/l, normal white cell differential count, platelets 120 × 10<sup>9</sup>/l. The concentration of alanine transaminase was 204 IU/l; all other biochemistry values were normal, including a blood urea concentration of 5.8 mmol/l.

He was treated with nebulised salbutamol and ipratropium, acyclovir infusion 750 mg eight hourly, and intravenous co-amoxiclav 1000 mg six hourly. His condition deteriorated and he was transferred to the intensive care unit and ventilated. On the seventh day his Pao<sub>2</sub> was 4.7 kPa on 60% inspired oxygen and the radiological changes had worsened (fig 2). Bronchoscopic examination was per-

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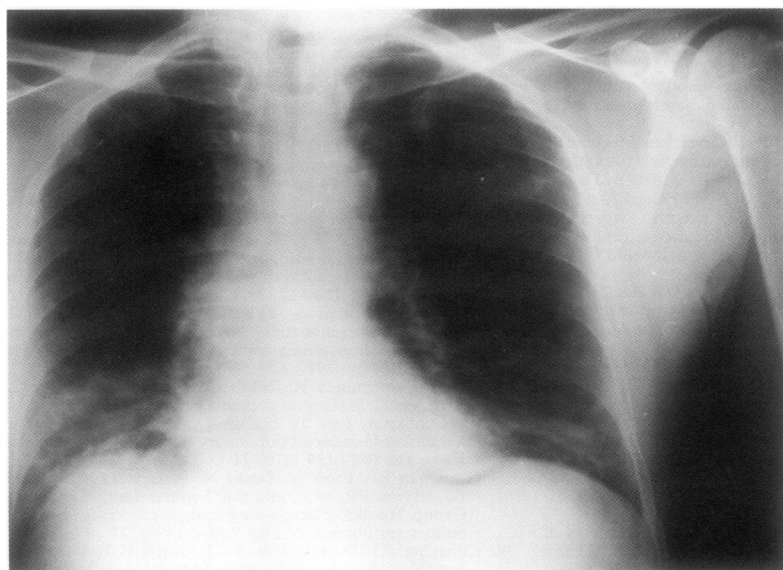


Figure 1 Chest radiograph on admission.

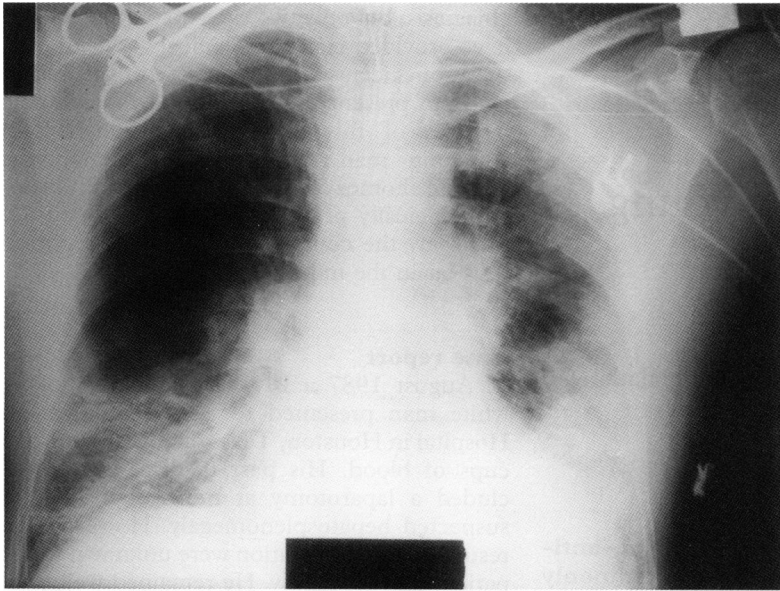


Figure 2 Chest radiograph on the seventh day, after clinical deterioration.

formed. Microscopic study of the bronchial washings and brushings confirmed numerous pus cells and gram negative rods which were identified as *Pseudomonas aeruginosa*; this organism was also isolated from nasal swabs. There was no evidence of pneumocystis pneumonia or cytomegalovirus bodies. Primaxin and gentamicin were added but he deteriorated further and died on the 14th day of admission. Acute phase viral titres were positive for herpes simplex at 1:128, but only weakly positive for varicella zoster at 1:8. No further specimens were taken.

### Discussion

Pneumocystis pneumonia has been reported following the addition of methotrexate to steroids in the treatment of asthma.<sup>6</sup> A search of the literature has revealed no reports of varicella pneumonia in this context. However, chickenpox is appearing more frequently in adults, with a corresponding increase in those with immunosuppression in whom the case fatality

rate (27%) is not falling and accounts for 29% of all deaths from chickenpox.<sup>1</sup> The clinical diagnosis of chickenpox was clearcut in our patient, with the history of contact and characteristic skin changes. The low initial titre suggests that there had not been previous exposure to varicella zoster which may be one factor in the increase in adult chickenpox. Nodules were seen on the radiograph in addition to the segmental changes.<sup>7</sup> This suggests that the primary cause of the pneumonia was varicella. Serious secondary infection has been reported in varicella pneumonia.<sup>8</sup> The superinfection and late presentation compromised response to treatment in our patient. Acyclovir, when started early, has been shown to reduce fever and tachypnoea and to improve oxygenation in normal subjects,<sup>4</sup> but others have found it less successful in pregnancy<sup>3</sup> and the epidemiological evidence suggests its impact is small in immunosuppressed patients.<sup>1</sup> It is therefore difficult to predict whether earlier treatment might have improved the outcome in this patient. Asthmatic patients on immunosuppressive therapy should be warned of the danger of exposure to virus infections of the herpes group. They should try to avoid contact with sufferers from chickenpox, particularly if they have no childhood history of the disease, and should report early for treatment if exposure to chickenpox or other viruses of the group occurs.

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