CASE REPORT

Adult Varicella Pneumonia That Responded to Combined Acyclovir and Steroid Therapy

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Summary

We describe a case of adult chickenpox which was complicated by severe varicella pneumonia, mild hepatitis and thrombocytopenia. The hepatitis and the thrombocytopenia were asymptomatic clinically and were diagnosed on biochemistry and blood count results. These eventually improved without specific interventions. The pneumonia, however, deteriorated rapidly despite the early commencement of oxygen supplementation, acyclovir and antibiotic. Subsequently, systemic corticorsteroid therapy was initiated and the patient was ventilated in the intensive care unit. The patient eventually recovered.

Key Words: Varicella pneumonia, Acyclovir, Corticosteroid, Mechanical ventilation

Introduction

The Varicella zoster virus, a member of the herpesvirus family, causes two distinct clinical entities: varicella or chickenpox, and herpes zoster or shingles. Chickenpox is a highly contagious disease with a high attack rate. Children between the ages of 5 and 9 are most commonly affected and account for 50% of all cases. Most other cases occur between the ages of 1 to 4 and 10 to 14 years. In the immune-competent child, this is usually a self-limiting benign illness with a very low rate of complications. However, in adults as well as immunocompromised children, chickenpox can be serious with severe and at times, fatal complications. We describe a case of adult chickenpox complicated by varicella pneumonia that responded to a combination of acyclovir and corticosteroid therapy as well as mechanical ventilation.

Case Report

A 36 year old male welder was admitted with a three-day history of fever, cough with blood-stained sputum and a generalized cutaneous rash. Before past medical history he smoked 20 cigarettes a day.

On examination, he was febrile and tachypnoeic. His whole body was covered with a typical chicken pox rash. The throat was injected, with shallow ulcers on the pharynx and the buccal mucosa. Examination of the chest revealed decreased intensity of breath sounds bilaterally and generalized crackles.

An urgent chest radiograph showed diffused hazziness in both lung fields with air bronchograms and a normal cardiac silhouette. A diagnosis of chickenpox with possible secondary bacterial bronchopneumonia was made. He was nursed in a side room and was started on intravenous (IV) cefuroxime and oral acyclovir. IV fluid, high-flow oxygen supplementation and antipyretic were also administered. His condition worsened two days later. He became more tachypnoeic and peripherally cyanosed. His temperature was still high, and he became confused, disorientated and irrational. Despite oxygen delivered via a ventimask at a concentration of 50%, his arterial blood gas (ABG) values were as follows: pH 7.48, PaO2 25.1mmHg, PaCO2 29.7mmHg and HCO3 21.7mmol/L. He was intubated and transferred to the intensive care unit for ventilation and further management.

The laboratory investigations sent during admission revealed a normal haemoglobin level of 18.2g/dL and a normal total white cell count of 5.9x10⁹/L. However, there was an atypical lymphocytosis of 15% and the platelet count was 59x10⁹/L. Both the aspartate transaminase and alanine transaminase were elevated at 89 and 72U/L respectively. The bilirubin and the serum protein were normal. There was no abnormality in the coagulation profile. The blood urea, serum electrolytes, creatinine and blood sugar were normal. Other tests including Widal test, blood film for malarial parasites, human immunodeficiency virus (HIV) serology, blood cultures, urine cultures, sputum cultures and sputum for AFB were negative.

A repeat chest X-ray after intubation was reported to be consistent with non-cardiogenic pulmonary oedema suggestive of acute respiratory distress syndrome. The oral acyclovir was changed to the IV formulation and the ceruroxime was substituted with ceftazidime. IV hydrocortisone 100mg qid was added.

Over the next 5 days, the patient made a remarkable recovery. The hypoxaemia was corrected and serial chest X-rays showed definite radiological improvement. The IV hydrocortisone was changed to oral prednisolone which was tailed down rapidly. He was extubated after six days.

However, after extubation, he remained tachypnoeic and produced plenty of sputum which required frequent oropharyngeal suctions. Twelve hours later, the patient deteriorated and was in severe respiratory distress. He was reintubated and mechanically ventilated. A repeat chest X-ray again showed bilateral generalized lung opacities. Over the following 3 days, his ABG remained poor despite an inspiratory oxygen fraction (FiO2) of 60% to 80%. He was eventually put on FiO2 of 100% and the oral prednisolone (now 15mg od) was changed to IV hydrocortisone 100mg qid. Again, we managed to step down the ventilatory settings gradually over the next 3 days. A tracheostomy was performed in view of the prolonged mechanical ventilation.

After fifteen days of intensive care, we managed to wean him off the ventilator. The IV hydrocortisone was again changed to tapering doses of oral prednisolone. He was eventually transferred to the general ward. By then, his repeat chest X-ray was much improved. We eventually weaned him off the tracheostomy and he was discharged well after thirty days stay in the hospital.

His oral prednisolone was gradually tailed down over a one-month period. On follow-up one month and three months later, he was well. A repeat chest X-ray was completely normal.

Discussion

Varicella pneumonia is the commonest and the most serious complication of chickenpox, occurring in up to 20% of adult patients with mortality rates of 10 to 50%[1]. Respiratory symptoms begin on the first to the seventh day after the cutaneous eruptions. Various factors have been studied to assess the likelihood of occurrence of varicella pneumonia in adults with chickenpox. The most consistent factor identified has been a history of smoking of more than 20 cigarettes a day[2]. Other predisposing factors include HIV infection, lymphoma, cytotoxic drug treatment, pregnancy and chronic liver disease[3].

The management of varicella pneumonia includes supportive care and the early use of antiviral agent. Acyclovir, a guanosine derivative that inhibits viral DNA polymerase, is the preferred antiviral agent employed. Various investigators have described the early use of acyclovir in varicella pneumonia with a favourable clinical course and outcome[1-3]. The possibility of secondary bacterial infection has to be rigorously excluded by radiological as well as bacteriological means and antibiotics should be used judiciously in cases of severe pulmonary complication. The early recognition of severe hypoxaemia, either by arterial blood gas measurement or pulse oxymetry, is vital in reducing mortality from varicella pneumonia. Once recognised, mechanical ventilatory support is an integral part of the management of severe lung involvement with hypoxaemia and tissue hypoxia[2].

A medline search revealed two reports[1,4] on the use of corticosteroids in the management of severe varicella pneumonia with favourable results. The most recent paper was published in *Chest* by a group of researches

from the University of Witwaterstand Medical School where the use of corticosteroid together with other therapeutic measures significantly reduced both ICU and hospital stays in six patients.

There was no mortality in these six patients. Our patient's lung function worsened despite the "early" use of acyclovir. However, it improved and enabled us to wean him off the ventilator when IV hydrocortisone was initiated. He then deteriorated and was reintubated. This could have been due to the steroid doses being tapered down too fast. The second time round, we tailed down the steroid doses much more slowly and we did not run into any more problem. Steroids could have made the difference in this patient's good clinical outcome apart from the acyclovir and the ventilatory support.

In conclusion, varicella pneumonia is a serious complication of adult chickenpox. Accurate diagnosis, early administration of acyclovir, anticipation of and aggressive ventilatory support for respiratory failure appear to be the key factors ensuring good clinical outcome. The role of steroids seems promising though it needs to be more rigorously studied and the treatment regime better defined.

References

1. Nilsson A, Ortqvist A. Severe varicella pneumonia in adults in Stockholm County 1980-1989. Scand J Infect Dis 1996; 28: 121-23.
2. Oh HM, Chew SK. Varicella pneumonia in adults - clinical spectrum. Ann Acad Med Singapore 1996; 25: 816-19.
3. Conti JA, Karetzky MS. Varicella Pneumonia in adult. NJ Med 1989; 86: 475-78.
4. Mer M, Richards GA. Corticosteroids in life-threatening varicella pneumonia. Chest 1998; 114:426-431.