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Pneumology

Varicella Pneumonia in Immunocompetent Adult: Clinical Case

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Abstract **Case Report**

Introduction*:** Chickenpox is a viral infection that is highly contagious and typically mild during childhood. However, in adults, it can lead to multivicseral complications, such as varicella pneumonia. ***Case report*:** A new case of varicella pneumonitis in an 18-year-old immunocopetent female patient was reported. The patient presented with acute respiratory distress, fever, and generalized maculopapular lesions. Chest imaging showed bilateral micronodular and nodular opacities. The diagnosis of Varicella pneumonia complicated with acute respiratory distress syndrome was confirmed after further investigations. Biologically, the patient had a thrombocytopenia, hepatic cytolysis and elevated lactate dehydrogenase levels. Treatment with antiviral treatment and oxygen therapy led to a positive outcome. ***Conclusion: Varicella pneumonia is the most frequent and serious complication of varicella in adults. It is often favourable under antiviral treatment.

Keywords: Pneumonia, varicella virus, immunocompetence.

INTRODUCTION

Varicella is an obligatory childhood disease, benign in the majority of cases, which can sometimes be complicated in healthy adults by visceral dissemination of VZV. Varicella pneumonia (PV) is the most common complication. It is characterized by fever and exanthematic and vesicular eruptions. Severe forms are often seen in immunocompromised patients, with significant morbidity and mortality. A healthy adult presented with minimal respiratory distress due to varicella pneumonia was reported in our study.

CASE REPORT

Upon admission, a young woman of 18 years old, who had no prior medical conditions, presented with febrile dyspnea accompanied by a dry cough and skin rash. The illness started 10 days prior to admission, marked by the onset of fever, asthenia, and a pruritic maculopapular rash that covered her entire body except for the palms and soles. Chickenpox was diagnosed due to her contact with her brother and the presence of vesicular lesions.

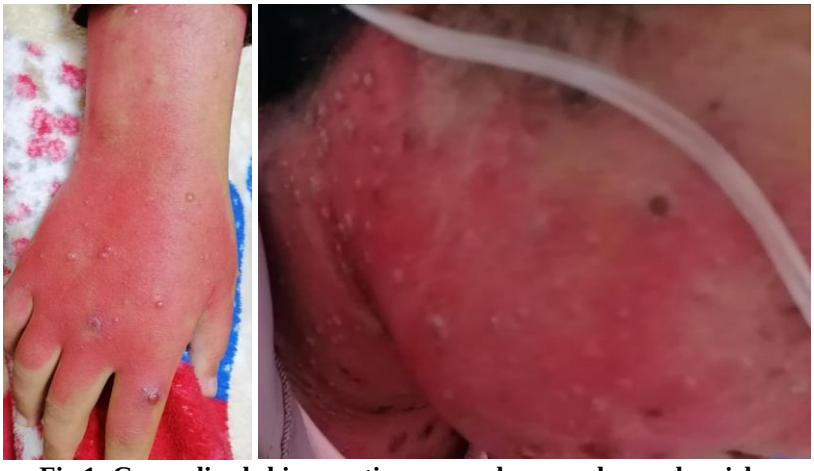

Fig 1: Generalized skin eruptions: macules, papules, and vesicles

The patient returned after four days with rapidly worsening dyspnea and a dry cough. Clinical examination revealed a fever of 39.5°C, blood pressure of 100/60 mmHg, polypnea at 28 cycles per minute, slight cyanosis of the extremities, discrete signs of respiratory struggle, percutaneous oxygen saturation of 87% in ambient air, tachycardia at 120 beats per minute, and on pulmonary auscultation, diffuse crackling. Additionally, the patient had a cutaneous eruption consisting of diffuse lesions all over the skin of different ages, with macules, papules, and vesicles that dried out and became crusty. The biological data indicated a white blood cell count of 6,000 per cubic millimeter, thrombocytopenia at 80,000 per cubic millimeter, CRP level of 41 mg/l, elevated LDH at 650 IU/l, accelerated sedimentation rate of 65 mm in the first hour, and mild hepatic cytolysis with ASAT at 100 IU/L and ALAT at 92 IU/L. The cytobacteriological examination and direct sputum bacillus test for Koch's bacillus (BKD) yielded negative results. HIV serology was negative, while varicella-zoster virus (VZV) serology IgM was positive. Diffuse bilateral alveolar-interstitial opacities were observed in two pulmonary fields on the chest X-ray (Fig 2).

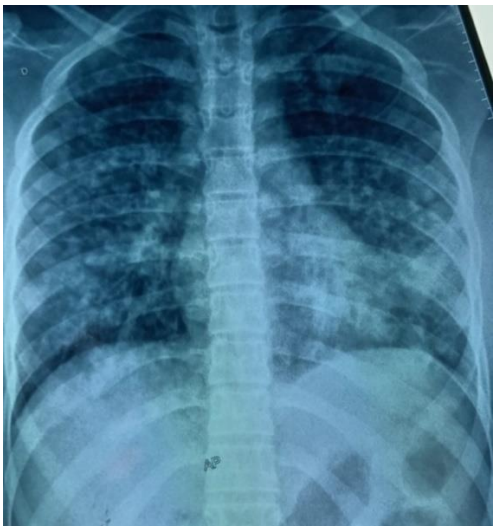

Fig 2: Alveolar-interstitial opacities

The chest CT revealed the presence of multiple nodules and scattered micronodules in two pulmonary fields, along with foci of pulmonary condensation (Fig 3). The patient was diagnosed with hypoxemic varicella pneumonitis and was prescribed antiviral treatment using intravenous acyclovir (10 milligrams per kilogram every eight hours). Additionally, nasal oxygen therapy was administered at a rate of 3 liters per minute. The treatment resulted in a positive outcome, with the patient achieving apyrexia after 48 hours, improvement in dyspnea, and resolving hypoxemia.

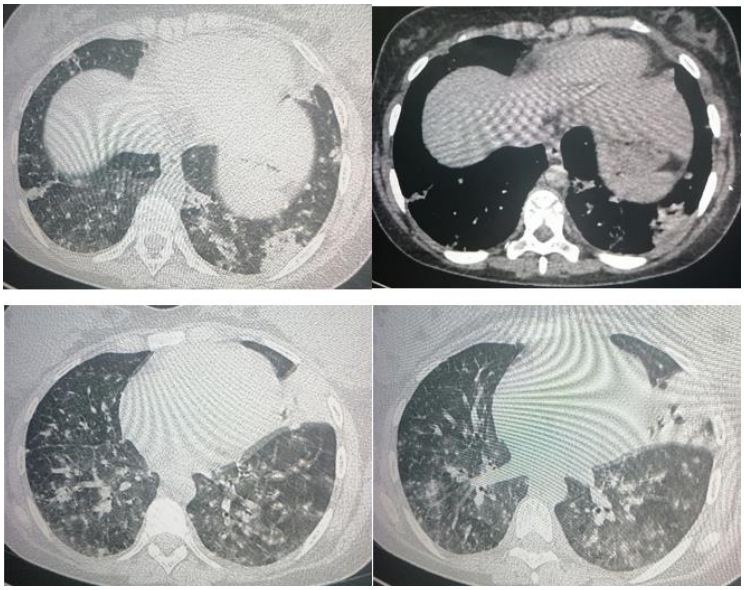

Fig 3: Chest CT revealed the presence of multiple nodules and scattered micronodules, with foci of pulmonary condensation

DISCUSSION

Varicella pneumonia is a manifestation of visceral dissemination of Varicella-zoster virus (VZV). This manifestation is more common and severe in adults, even without any underlying immunodepression, compared to children [1].

The estimated incidence of varicella pneumonia ranges from 16% to 33%, and it can lead to mortality rates as high as 20-50% %, with lesional oedema and multiple organ failure [2, 3]. Adults have a significantly higher risk of pulmonary damage compared to children, with the risk being 25 times greater. This risk is even more pronounced in adult smokers, with a risk of 40% [1, 2]. Various complications resulting from the viral dissemination have been documented, such as the occurrence of encephalitis, hepatitis, and coagulation disorders [4]. Generally, patients present with respiratory symptoms within one to seven days of the onset of a rash, They include a dry cough sometimes accompanied by haemoptysis, pleuretic chest pain, dyspnea, fever and even acute respiratory distress [4].

The connection between smoking and the risk of varicella lung disease remains unclear, although it could be attributed to the harmful effects of smoking on the respiratory tract's mucociliary capacity [5] and the activity of alveolar macrophages [6]. Numerous risk factors have been identified for pulmonary involvement in varicella, including male sex, adulthood, extensive skin involvement more than 100 elements, pregnancy, close contact with an infected person, and immunosuppression [2, 3-7]. Our patient exhibited several of these risk factors, such as being an adult, having recently contracted varicella, and experiencing an extensive rash.

Usually, thoracic imaging displays multiple ill-defined nodules that are 5-10 mm in size and may come and go in different areas of the lungs. Occasionally, there may be unsystematized hiliform opacities or heterogeneous infiltrates, which may or may not be accompanied by a halo of ground-glass attenuation around the nodules or patchy ground-glass attenuation [3, 5]. Mediastinal adenopathy or pleural effusion is predominantly observed in immunocompromised patients, and its occurrence without superinfection is extremely uncommon [3]. Radiological images typically clear up within a week after the skin lesions vanish, although they may endure for several months [8]. Persistent calcifications may manifest as subcentimeter nodular densities scattered throughout the lungs, alongside normal lung findings [16].

The bronchial endoscopy in adults has the potential to uncover vesicular lesions on the bronchial mucosa. Nevertheless, the incidence and the clinical and prognostic implications of these lesions are still not fully understood [9]. Bronchial fibroscopy was not conducted in our case due to the patient's respiratory condition being unsuitable, and their progress was favourable.

The extent of damage to the parenchyma can be evaluated by analyzing gas levels, specifically the correlation between hypoxemia and the severity of dyspnea [5].

Varicella pneumonia diagnosis lacks a gold standard. However, in a high-risk setting, the diagnosis can be established through a combination of lung involvement, radiological features, and a skin rash that indicates varicella, without any evidence of a secondary cause [3].

Microbiological tests such as viral culture and gene amplification methods are typically not needed for skin lesion fluid, blood, and respiratory samples when the radio-clinical presentation is typical. These tests are primarily used for atypical cases and when a definitive diagnosis is necessary, such as in immunocompromised individuals or pregnant women. Other tests like cytodiagnosis, biopsy, and serology do not provide practical value [10]. The patient's diagnosis was established by considering the recent varicella infection, the onset of respiratory symptoms four days after the appearance of the rash (which strongly indicated varicella), chest imaging findings, and the positive response to antiviral treatment.

The consensus conference on anti-infectious therapeutics suggests that antiviral treatment is the recommended curative option for PV. The preferred antiviral is aciclovir, but valaciclovir or ganciclovir can also be used for a duration of seven to ten days [3, 11-13]. There is currently no evidence to support the effectiveness of antiviral treatment in preventing or reducing the severity of pulmonary complications caused by chickenpox. Similarly, there is a lack of studies with sufficient evidence to determine the effectiveness of corticosteroid therapy in severe cases of chickenpox.

Early management can often lead to quick and positive clinical and radiological outcomes. Nevertheless, literature reports cases of mortality when faced with lesional oedema and multiple organ failure. Such cases have been documented in references [2, 3].

Preventive measures for non-immune individuals vary from basic isolation to using immunoglobulins or aciclovir as a preventive treatment. The specific measures depend on whether prevention is intended before or after exposure to the virus, as well as the immune status of the individual (immunocompetent, immunocompromised, or pregnant). Ultimately, prevention is the most effective form of treatment [14, 15].

CONCLUSION

PV is a frequently encountered complication in adults who have had chickenpox. Whenever PV is observed, it serves as a signal to investigate for any underlying weakened condition. The timely and methodical administration of aciclovir in suspected PV cases has played a crucial role in reducing mortality rates significantly. Recent studies have reported that the mortality rate does not surpass 1% among PV cases, highlighting the effectiveness of early intervention with aciclovir.

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