Varicella Pneumonia in Young Adult Male: A Case Report

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ABSTRACT

Varicella infection is a common disease in pediatric age group but is uncommon in adult. Varicella pneumonia is the dreaded complication in these patients leading to mortality, which is more pronounced in adult patients. This is a case report of a young adult male, presenting with Varicella pneumonia in severe hypoxic respiratory failure, which was successfully managed with oxygen therapy, acyclovir, and steroids.

Keywords: Varicella Zoster; Viral Pneumonia

INTRODUCTION

The Varicella Zoster Virus (VZV) also known as (chicken pox) belonging to the Alpha-herpes-viridae subfamily, transmits mainly through the inhalation of virus laden saliva droplets or by direct contact with vesicular lesions[1]. Initial infection with VZV, typically seen in age of one to nine years, is not so common in adults, but when present is generally more severe[2]. Here we present a case report of a young adult presenting as Varicella pneumonia.

CASE:

A 23-year male, active smoker (3 pack-year) from Eastern Terai of Nepal, working as mason [significant exposure to sand particles] from last 7-8 years. Meanwhile, his 3-year-old child started to develop fever along with multiple maculopapular rashes and 5 days later he himself started to develop similar symptoms. Four days after it, he started to have dry cough and progressive dyspnea, as such within three days dyspnea was severe enough that he presented in emergency OPD of BPKIHS, Dharan.

On emergency OPD he was tachycardic (regular heart rate of 144 beats per minute), tachypneic with labored breathing and in hypoxic respiratory failure, which was urgently managed by oxygen therapy. The chest examination showed diffuse bilateral inspiratory crepitation and end expiratory wheeze. Cardiac examination was not grossly abnormal except for bilateral mild pitting edema. Chest Xray in admission (Figure 1) had bilateral diffuse interstitial as well as alveolar opacities, suggestive of atypical pneumonia pattern.

In view of suspected acute respiratory distress syndrome, patient was urgently shifted to Pulmonary Critical Care Unit and was kept under an interim Non-Invasive Ventilation support, which attenuated the work of breathing of patient, keeping an eye upon the need of invasive mechanical ventilation. His laboratory report showed lymphocytosis and monocytosis but thrombocytopenia with maintained international normalized ration. There was non-obstructive transaminitis without azotemia and active urinary sediments.

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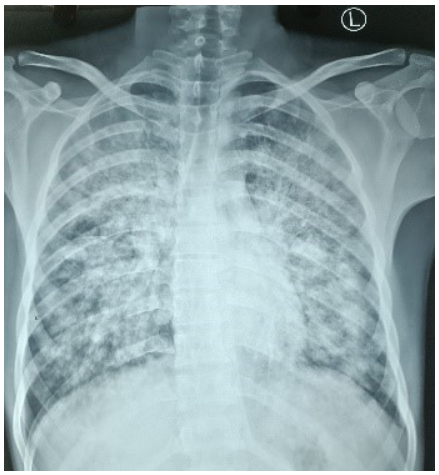

Figure 1: Admission Chest Xray shows basal predominant and relative peripheral sparing bilateral fluffy alveolar opacities along with bilateral upper zone interstitial infiltration, without increased cardiac shadow.

Cutaneous findings characteristically (figure 2) consistent with chickenpox having multiple vesicles scattered over the trunk, displaying the typical fluid-filled, small, round, raised appearance with clear or slightly cloudy centers were seen. The lesions were distributed in a generalized manner, prominently involving the torso, which is a common initial presentation before spreading to the face and extremities. Notably, the lesions were in various stages of development, including vesicles, pustules, and crusts, illustrating the classic "crops" pattern of successive waves of new vesicles. Some lesions exhibited an erythematous base, indicative of surrounding inflammation. The distribution was discrete, with individual lesions not forming large confluent areas, further aligning with the typical presentation of chickenpox as opposed to other viral exanthems.

Thus, in view of appropriate contact history, characteristic cutaneous lesion, and chest radiology, he was diagnosed with Varicella pneumonia and was started with Acyclovir. Regarding the endemic region, thrombocytopenia, chest findings, transaminitis and generalized features of capillary leakage syndrome we started on doxycycline with benefit of doubt.

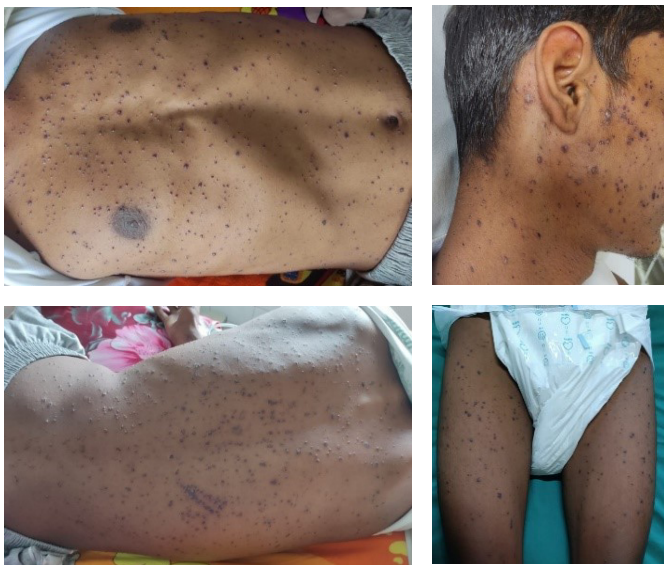

Figure 2: Pictures showing the generalized rashes present in the patient.

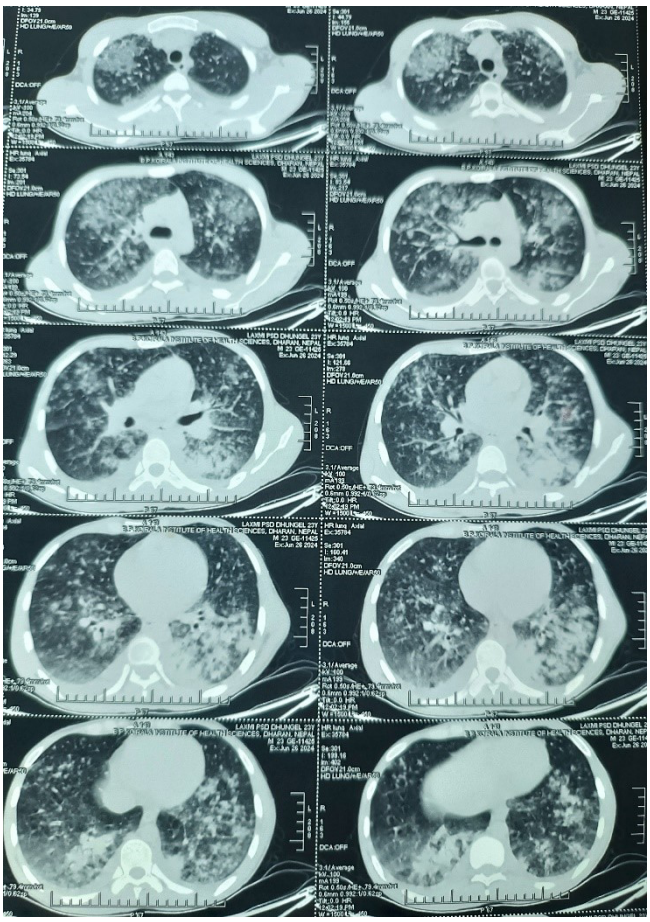

Figure 3: HRCT chest demonstrated diffuse ground glass opacity with bilateral lower lobe alveolar opacity and pleural effusion without enlarged cardiac borders.

Despite of it, severity of patient's hypoxic respiratory failure did not improve, so injectable dexamethasone was started about 24 hours of starting the antiviral therapy. Meanwhile HRCT chest of patient was done, which was also suggestive of viral pneumonia (figure 3). About 24 hours after the use of steroids the need for oxygen support gradually started to decrease. After 2 more days of critical care stay, he was shifted to Pulmonary and Sleep ward in nasal prongs support, 2 days after which he was discharged.

About eight days after the discharge patient revisited us for the follow up, without requirement of oxygen support nor with increased work of breathing, albeit had significant anorexia, which was prognosticated to have occurred. Chest had significantly improved as shown below (figure 4).

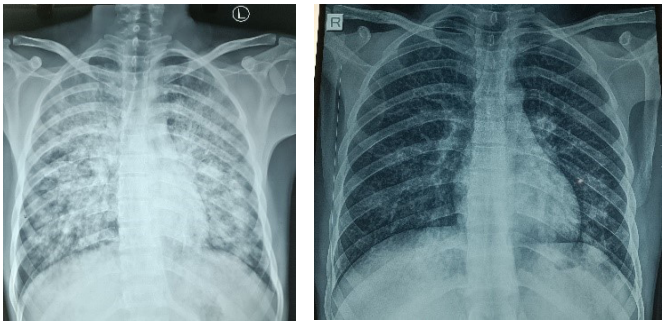

Figure 4: Chest Xray of the patient at presentation(left) and after eight days(right), demonstrating the significant improvement.

DISCUSSIONS:

Chicken pox, a highly infectious and contagious infection is primarily a disease of children presenting as fever and classical rash, associated with headache and malaise and in severe form may be accompanied by interstitial pneumonia. They are transmitted via contact with skin lesion and by respiratory aerosol. Rash classically begin as macules, which progress to papules followed with a fluid filled vesicular phase and then heal via crusting, which slough off after about 10 days.

Immunocompromised patient usually develops severe and disseminated disease[2]. Respiratory complication, specifically pneumonia, is the most life threating complication of the disease. The population with age 20 years or older constitute only 7% of the total Varicella infections[3] and about 5% to 15% cases of adult varicella will have a type of respiratory complication[4]. In overall healthy adult has a 25 times higher risk of developing complications than a child[5].

Various established risk factors for developing varicella pneumonia include history of contact with a patient having chickenpox, previous or current smokers, chronic lung diseases, impaired immune status, severity of the skin rash, and third trimester of pregnancy[6].

Mohasen et al studied 38 adult patients with Varicella, half of which had Varicella pneumonia. They showed that presence of respiratory symptoms, active smokers, and history of close contacts of Varicella patients were significantly associated with development of Varicella pneumonia, along with more severe rash. They saw smokers had statistically significant a greater number of rashes than the non-smokers[7]. This had synchrony with our cases in terms of risk factors as well as the number of rashes. Our patient had a more risk factor of exposure to silica dust. Similar case report was reported by Shrestha et al from tertiary care teaching hospital from eastern Nepal in which a 43-year construction worker, smoker male had similar pattern of Varicella pneumonia. Causal association of silicosis with Varicella pneumonia has not been established yet, albeit its biologically plausible that silica exposure which has a negative impact on the alveolar macrophage as well as the bronchial epithelium might perpetuate a patient to develop the complications[8].

Varicella having cytopathic effect with mononuclear cell infiltration typically demonstrates multiple ill-defined nodules that might be confluent in radiology. Classically, dense consolidation and pleural effusion is rare. After improvement of the skin lesion, the radiology generally disappears within a week. CT scan of chest typically has ill-defined nodules with diffuse ground glass opacity (GGO) and the nodules might coalesce. On follow up of these lesions they may calcify[9]. Contrary to it our patient demonstrated GGO but no significant nodular lesions.

Management of Varicella pneumonia warrants early introduction of antiviral agents with enhanced in vitro activity, improved pharmacokinetic properties, and excellent safety profiles.[10] Trials show significant benefit of administering acyclovir before 24 hours in context of reducing the severity of the skin rash in immunocompetent adults. The consensus is to use it daily for 7-10 days and to be tailored according to each patient's clinical assessment[6]. Mohasen et al summarized 46 reports, enrolling 272 Varicella pneumonia patients in which 11 out of 179 patients those were treated with acyclovir died, but 17 out of 89 patients died who weren't treated with any drug. This showed a significant difference between the two groups as such death rate was 3.6 times greater (95% CI 1.63–7.95; p=0.001) in the latter group who did not receive acyclovir. In context of severe Varicella pneumonia, there is need of early intravenous infusion, which further can be curtailed to oral therapy as per the clinical response[6]. Similarly, we started the drug as soon as the clinical suspicion of Varicella pneumonia was made, albeit its role after 5 days of rashes eruption couldn't be firmly established.

As with other medication, a note of caution should be kept while using intravenous acyclovir, that has a propensity to cause Acute kidney injury. The most common mechanism related to it is crystal nephropathy. Although this entity is under looked, serial serum creatinine monitoring can detect it early, especially 12-48 hours of drug administration. This can be minimized maintaining proper hydration state before drug administration, avoiding rapid infusion of the drug (to infuse slowly over 1-2 hours), and adjusting the dose according to glomerular filtration rate, along with avoiding other nephrotoxic drugs. When detected immediate stoppage of drug along with maintaining high urinary flow rate is needed, if needed with intravenous saline and high ceiling diuretics (forced diuresis)[11].

Mer et al, studied fifteen Varicella pneumonia adult patients among which six of them received corticosteroids along with antiviral therapy. Clinically significant response was seen in these group of patients in the form of significantly shorter hospital stay. Corticosteroid was started in these patients because of significantly lower oxygen saturation, despite of it there was no mortality. Thus, they concluded that corticosteroids seem to be of value in treatment of patients with life-threatening varicella pneumonia in addition to antiviral and supportive therapy[12]. Cheng reviewed 120 immunocompromised patients case reports regarding the use of steroids along with acyclovir which suggested that the dual treatment may be associated with a lower mortality than acyclovir alone (0% vs 10.3%)[13]. Similar to the study we had introduced dexamethasone about 24 hours of no significant response to acyclovir, after which patient improved after 24-hour in term of oxygen requirement.

CONCLUSIONS:

The syndromic approach of hypoxic respiratory failure with diffuse maculopapular rashes in the appropriate contact history warrants to keep the varicella pneumonia as a differential diagnosis. Varicella pneumonia has and should be managed accordingly. Similarly, when Varicella pneumonia does not respond with the standard care of management with acyclovir and oxygen support, addition of corticosteroids can lead to response, the need of which should be determined clinically. While administering acyclovir we need to keep an eye on hydration status, rate of infusion of acyclovir and serum creatinine monitoring.

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