

A Case of Respiratory Failure due to Smallpox Pneumonia

Su Çiçeği Pnömonisine Bağlı Solunum Yetmezliği Olgusu

Fatmanur Çelik Başaran¹, Nimet Aksel², Mine Gayaf², Ayşe Özsoz², Dursun Tatar²

Abstract

Smallpox pneumonia is a rare complication of the smallpox infection. We present our case of required mechanical ventilation related to smallpox pneumonia in association with respiration failure. A 31-year-old female applied to our emergency department due to cough, tachypnea, and a common papulovesicular skin rash as her radiological investigations bilateral nodular pulmonary infiltrates were diagnosed. She had a contact history, with her baby experiencing the smallpox disease. According to clinical and laboratory findings the case was diagnosed as smallpox pneumonia. Acyclovir 4 gr/day p.o. antiviral management was initiated. At the second day severe dyspnea and cyanoses occurred and patient transferred to intensive care unit after intubation. After 48 hours with mechanical ventilation the patient extubated herself. After 15 days of acyclovir treatment a remarkable clinical and radiological recovery was observed. During smallpox disease symptoms of pneumonia and also possible hypoxemia must be closely monitored in order to prevent mortality due to respiratory failure.

Key words: *Pneumonia, respiratory failure, smallpox.*

Özet

Suçiçeği pnömonisi bu hastalığın seyri sırasında görülebilen nadir bir durumdur. Burada suçiçeği pnömonisi sonrası mekanik ventilasyon gerektiren ciddi bir solunum yetmezliği gelişmiş bir olguyu sunmaya çalıştık. Otuz bir yaşında kadın hasta, hastanemizin acil servisine öksürük, apne, takipne ve yaygın papuloveziküler döküntü bulgularıyla başvurdu. Radyolojik incelemelerde bilateral nodüler dolgunluk izlendi. Hikâyesinde suçiçeği geçiren bebeği ile teması olduğunu anlattı. Klinik ve laboratuvar bulguları ile hastaya suçiçeği pnömonisi tanısı kondu. Hasta yatırılarak asiklovir 4 gr/gün tedavisi başlandı. Yatışının 2. gününde ciddi dispne ve siyanoz bulguları gelişmesi üzerine entübe edilerek yoğun bakım ünitesine alındı. Mekanik ventilasyon ile 48 saat tedavi sonrası hasta kendini ekstübe etti. Asiklovir tedavisi ile 15 gün sonra belirgin klinik ve radyolojik düzelme sağlandı. Suçiçeği hastalarında görülen pnömoni, gelişebilecek hipoksemi ve solunum yetmezliğine bağlı ölüm ihtimaline karşı yakından takip edilmelidir.

Anahtar Sözcükler: *Pnömoni, solunum yetmezliği, suçiçeği.*

Smallpox is an infectious disease caused by the varicella zoster virus. It is more commonly encountered during childhood and characterized with fever and skin rash. Smallpox pneumonia is one of the most severe complications of smallpox infection that is experienced during adolescence and

may be correlated with death due to respiratory failure (1). In adults, smallpox pneumonia prevalence remains in the range of 0.25-1.8 %. In the most of the cases cough, fever, dyspnea, and tachypnea are the most common symptoms (1,2).

¹Department of Chest Diseases, Iğdır State Hospital, Iğdır, Turkey
²Department of Chest Diseases, Dr. Suat Seren Chest Diseases and Thoracic Surgery Training and Research Hospital, İstanbul, Turkey

¹Iğdır Devlet Hastanesi, Göğüs Hastalıkları Kliniği, Iğdır
²Dr. Suat Seren Göğüs Hastalıkları ve Cerrahisi Eğitim ve Araştırma Hastanesi, Göğüs Hastalıkları Kliniği, İzmir

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Correspondence (İletişim): Fatmanur Çelik Başaran, Department of Chest Diseases, Iğdır State Hospital, Iğdır, Turkey
e-mail: fatmanner@hotmail.com



CASE

A 31-year-old female applied to our emergency department due to cough, fever, and chest pain for the previous three days. She had had a common papulovesicular skin rash, including on her scalp for one week. She had a contact history, with her child experiencing smallpox disease previously 15 days. She was a smoker (10 pack-*et/year*) for five years and had no history of any drug use, malignancy or any chronic disease.

During the physical examination, the patient was conscious, oriented, and cooperative. Her blood pressure was 90/60 mmHg, heart rate 128/ min, body temperature 38°C, respiratory rate 20/min, and oxygen saturation 85%. A common papulovesicular rash was observed over her entire body (Figure 1). A respiratory system examination revealed mild cyanosis and tachypnea, and in auscultation, bilateral inspiratory rales were present. In cardiac auscultation there were no other abnormalities, except mild tachycardia.



Figure 1: Papulovesicular skin lesions

The laboratory findings were: hemoglobin 11 g/dl, hematocrit 35%, leukocyte 6000/ μ L, platelets 240,000/ μ L, alanine transaminase 47 U/L, aspartate transaminase 48 U/L, creatinine 0.76 mg/dl, urea 22 mg/dl, sodium 133 mmol/L, potassium 4 mmol/L, and chloride 100 mmol/L. Arterial blood gas analysis without oxygen support; pH 7.44, pO_2 59 mm/Hg, pCO_2 33 mm/Hg, HCO_3 22 mEq/L, and oxygen saturation 92%.

As per radiologic investigations, bilateral nodular pulmonary infiltrates were diagnosed (Figure 2-up). According to the clinical and laboratory findings, the case was diagnosed as smallpox pneumonia. Acyclovir 4 gr/day p.o. antiviral management was initiated. On the second day of hospitalization, severe dyspnea and cyanoses with a decrease in oxygen saturations of till 58% occurred and patient transferred to the intensive care unit after intubation (Figure 2-mid). After 48 hours with mechanical venti-

lation the patient extubated herself and remained in spontaneous respiration five more days in association with 2 L/min oxygen management. Oxygen saturation remained at 99% during the recovery period. After 15 days treatment with acyclovir remarkable clinical and radiological recovery was observed (Figure 2-down).

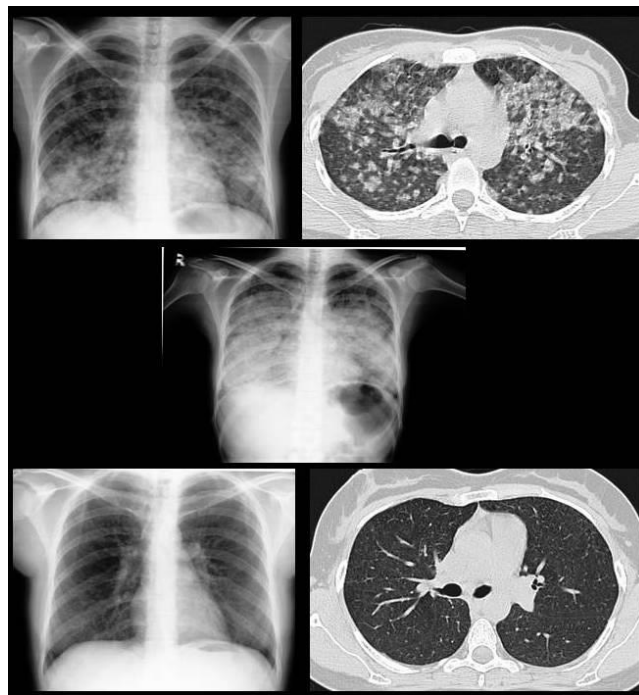


Figure 2: Chest x-ray and computer tomography of patient

DISCUSSION

In adults, nearly 75% of smallpox pneumonia occurs between the ages of 30 and 50. The severity of these pneumonias varies from mild to fatal, due to severe respiratory failure (1). Progression to acute respiratory failure and 50% mortality rates may be seen especially in immune suppressive patients (3,4). There are various risk factors for the progression of pneumonia during the primary varicella zoster virus infection: the development of respiratory symptoms, smoking, skin sing of more than 100, contact with a patient or a baby with smallpox, pregnancy, immune deficiency, chronic pulmonary disease, and the male gender (1,5). Our case was an active smoker, had a history of contact, and a common rash but immune deficiency did not exist. There is nothing in her anamnesis that can cause immune deficiency such as chronic disease, malignancy, chronic use of drug and etc. Symptoms and signs of varicella pneumonia appear one to six days after the appearance of skin lesions (6). Patients have the symptoms including cough, hemoptysis, chest pain, dyspnea, while severe cases may have respiratory insufficiency and cyanosis (1,6). In our case,

symptoms of cough, fever, chest pain and dyspnea also occurred four days after the appearance of skin eruptions. Respiratory insufficiency was detected on admission.

The typical radiological appearance of varicella pneumonia is well-circumscribed nodular opacities 5-10 mm in diameter and consolidations formed by the congregation of these nodules. These lesions are prominent around the hilum and in bases. Hilar lymphadenomegaly and pleural effusion are rarely seen (1). These lesions generally begin to disappear one week after the healing of the skin eruptions. Radiological changes may sometimes persist for months. In some cases, bilateral widespread calcifications of 2-3 mm in diameter may persist as a sequel. These radiological findings, together with skin lesions, are usually diagnostic (1,7,8). Our case also had a similar radiological appearance on admission.

The mortality rate of varicella pneumonia is 15%. Various studies have reported that the early initiation of acyclovir treatment might be lifesaving by preventing this severe complication of varicella (1,4). Early treatment is defined as the treatment commenced within the first 36 hours in immunocompetent adults aged above 18 years and who have been hospitalized for radiologically evident pneumonia (1). The recommended dose of intravenous acyclovir treatment for pregnant patients with severe complications and patients with a weak immune response is 10 mg/kg every 8 hours. Famciclovir and valacyclovir have proven efficacious for the treatment of adult herpes zoster infections. Acyclovir-resistant VZV infections may be treated with foscarnet (9). In our case, we also achieved a complete response using oral acyclovir tablets at a dose of 5x800 mg.

Mohsen et al. (10) analyzed 46 studies and compared cases with acyclovir treatment and cases without acyclovir treatment. They reported that the mortality rate was 3.6-times higher in the group without treatment. Varicella pneumonia related deaths usually occur due to respiratory insufficiency in patients who need intensive care follow up and mechanical ventilation. Findings other than hypoxia were reported to be weak indicators of disease severity for these cases (11). It is also not possible to predict which cases will need mechanical ventilation support (12). For this reason, close follow-up of the patients with pulse oximeter and arterial blood gas analysis is important. In our case, we performed arterial blood gas follow up after the confirmation of hypoxia with pulse oximeter and arterial blood gas analysis. In the studies, it was reported that oxygen support via oxygen masks, non-invasive respiratory support and invasive respiratory sup-

port in those cases that failed to respond non-invasive respiratory support, may be used for respiratory insufficiency, based on the clinical status of the patient (11). Despite medical treatment and oxygen support, our case was intubated in the inpatient clinic due to deterioration in arterial blood gas and consciousness. After self-extubation in the 48th hour of mechanical ventilation, the patient did not need further invasive or non-invasive mechanical ventilation. The patient did not require intensive care unit follow up after the tenth day and discharged on the seventh day with complete healing.

In conclusion, adult cases with varicella infection and respiratory symptoms need particular attention. Cases with hypoxia must be closely followed for respiratory insufficiency.

CONFLICTS OF INTEREST

None declared.

AUTHOR CONTRIBUTIONS

Concept - F.Ç.B., N.A., M.G., A.Ö., D.T.; Planning and Design - F.Ç.B., N.A., M.G., A.Ö., D.T.; Supervision - F.Ç.B., N.A., M.G., A.Ö., D.T.; Funding - N.A., D.T.; Materials - F.Ç.B., M.G., A.Ö.; Data Collection and/or Processing - F.Ç.B.; Analysis and/or Interpretation - N.A., M.G.; Literature Review - F.Ç.B.; Writing - F.Ç.B.; Critical Review - N.A., M.G., A.Ö., D.T.

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