



## Case report

## Febrile neutropenia due to H1N1 infection: Rare entity

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## ABSTRACT

**Background:** Febrile neutropenia is one of the most feared complications in actively treated patients in oncology clinics. The impact of H1N1 infection on the management of the febrile neutropenia in endemic areas, especially if the patient is presented with pulmonary symptoms, is not clear.

**Case report:** A Forty seven year old male patient diagnosed with mantle cell lymphoma, admitted to our center with neutropenic fever 8 days after chemotherapy. The patient revealed classical symptoms of influenza like headache and myalgia and also had rhonchus and cough supporting lower respiratory tract infection. He was finally diagnosed as influenza A (H1N1) infection.

**Conclusion:** Influenza infection is an important etiological agent in immunocompromised hosts, namely neutropenic patients, which cause significant morbidity and mortality. Viral etiology and antiviral treatment should also be considered in suspected patients especially during epidemics and pandemics.

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## 1. Introduction

Febrile neutropenia is one of the most feared complications in actively treated patients in oncology clinics. These patients usually require hospitalization and initiation of broad-spectrum antibiotics.<sup>1,2</sup> Bacterial, fungal and viral pathogens can cause infections in neutropenic patients. The treatment of febrile neutropenia consists of broad spectrum antibiotics and occasionally antifungal coverage can also be needed especially in the case of long lasting neutropenia.<sup>3</sup> Since substantial proportion of respiratory infections are composed of influenza during epidemics, viral etiology and treatment should be taken into account during epidemic and pandemic periods in this unique population.<sup>4</sup> Herein we present atypical course of a neutropenic patient that finally diagnosed as influenza A (H1N1 strain) infection.

## 2. Case

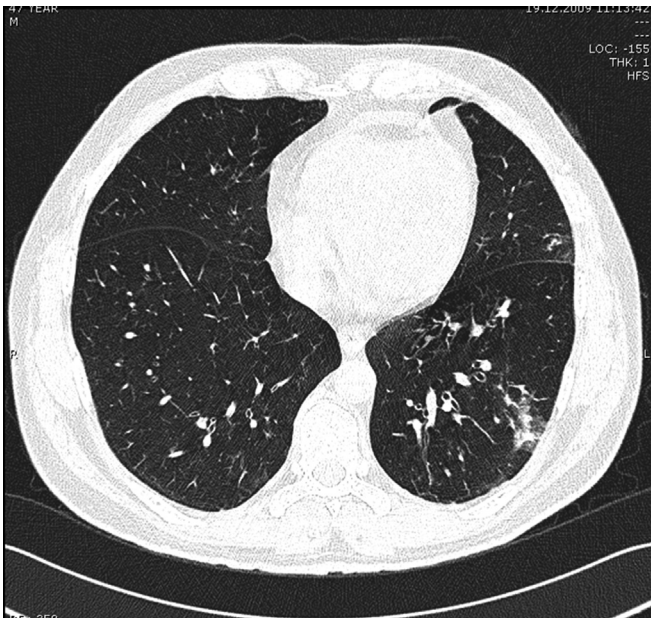
A Forty seven year old male patient diagnosed with mantle cell lymphoma was treated with 6 courses of combination chemotherapy. The chemotherapy regimen was composed of rituximab plus hyperCVAD (cyclophosphamide, vincristine, doxorubicin,

dexamethasone) alternating with rituximab plus high dose methotrexate and cytarabine. The patient was admitted to our center with neutropenic fever 8 days after the 2nd arm of the 6th cycle. He was receiving prophylactic antimicrobials (levofloxacin, fluconazole and valacyclovir) and also G-CSF (granulocyte colony-stimulating factor). On admission the patient complained of nonproductive cough, myalgia and headache. He denied sore throat, sputum production and rhinorrhea. The physical examination revealed rhonchi on both sides of the lungs and was otherwise normal. Complete blood count revealed pancytopenia (hemoglobin: 8.5 g/dL, platelet: 58,000 cells/microL, absolute neutrophil count was 150 cells/microL) and chemistry panel was normal. Radiographs of chest revealed no infiltration. Piperacillin tazobactam 4.5 g every 6 h and G-CSF was employed after blood and urine samples were collected for culture. Teicoplanin and clarithromycin were added after 48 h of admission. High resolution computed tomography performed, due to persistent pulmonary signs and symptoms, demonstrated left-sided pulmonary infiltration (Figs. 1 and 2). Neither bacterial, nor fungal pathogens were isolated from blood and urine cultures. Nasal and throat swab samples, obtained on 3rd day of fever, were positive for influenza A (H1N1 strain). Samples were tested by using Influenza A H1N1/09 Real-Time RT-PCR assay. Oseltamivir phosphate 150 mg twice daily was given for 10 days. After admission to hospital, fever ceased on the 8th day, 2 days after neutropenia had resolved. The patient discharged on the 10th day with a good health.

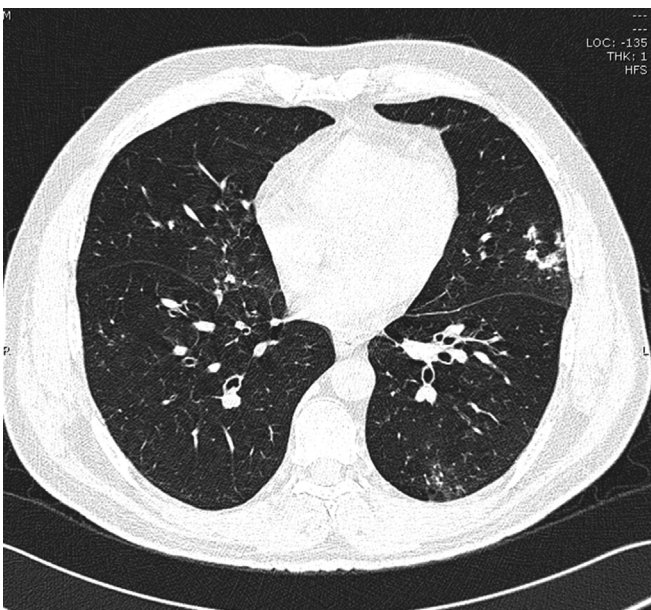
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**Fig. 1.** High resolution computerized tomography revealed infiltrations in the superior segment of the lower lobe of left lung.



**Fig. 2.** High resolution computerized tomography revealed infiltrations in the superior segment of the lower lobe of left lung.

### 3. Discussion

Neutropenic fever is constituted of neutropenia, defined as an absolute neutrophil count (ANC) <500 cells/microL, and fever >38.3 °C once or 38 °C for more than 1 h.<sup>4</sup> Empirical broad-spectrum antibiotic therapy is crucial. Although the respiratory and gastrointestinal tracts and skin are the common sides of

infection, the cause of fever cannot be identified in 60–70 percent of patients.<sup>5</sup> Initial empirical antibiotic regimen in the management of neutropenic patient may be not curative. Extended spectrum beta-lactam alone or in combination with an aminoglycoside may be started initially. Addition of vancomycin for gram positive coverage and/or antifungal therapy may be conceived according to the clinical course and culture results. The routine administration of antiviral therapy is not advocated.<sup>4</sup>

Although, the probability and outcome of influenza infection in immunocompromised patients are not exactly defined, it may play role particularly in the pneumonia of unknown etiology during the winter. Elting et al<sup>6</sup> had screened adult leukemia patients for respiratory infections during the epidemic period and reported that influenza was the cause of 21% of infections that developed during hospitalization and 4% of community acquired infections. Whimbey et al<sup>7</sup> conducted a prospective study to evaluate the role of community respiratory virus infections in bone marrow transplant recipients and reported that % 29 of all acute respiratory infections were due to influenza A during the 1991–1992 influenza epidemic in Houston.<sup>6</sup>

The presenting signs and symptoms of influenza infection were found similar in normal population and immunocompromised patients.<sup>8,9</sup> Our patient revealed not only classical symptoms of influenza like headache and myalgia but also had rhonchus and cough supporting lower respiratory tract infection. Since primary influenza and secondary bacterial pneumonia are the most important and mortal complications during the course of influenza prompt evaluation and treatment is required.<sup>10</sup>

In conclusion, influenza infection is an important etiological agent in immunocompromised hosts, namely neutropenic patients, which cause significant morbidity and mortality particularly during outbreaks and epidemics. Although antibacterials and antifungals are the mainstay of treatment in neutropenic fever, viral etiology and antiviral treatment should also be considered in suspected patients especially during epidemics and pandemics.

### Conflicts of interest

The authors declare that they have no competing interests.

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