Influenza A (H1N1) Pneumonia in an Immunossupressed Patient after Heart Transplantation

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The role of the immune response during Influenza H1N1 virus infection is not yet fully established, but it is believed that it decisively participates in the severity of the disease as well as in the development of acute respiratory distress syndrome. The role of immunomodulating therapies in the control of viral infections is not a consensus either, and data from the literature defining the indications for their use are lacking. The present report is, to our knowledge, the first on a heart transplant patient who developed H1N1 virus infection and had a favorable outcome, thus generating discussion on the real role of immunosuppressive therapy as a risk factor for the severe form of the disease.

Introduction

In the current influenza pandemic with the Influenza H1N1 virus, some factors have been associated with an increased risk for a more severe disease, among which, immunosuppressive conditions. In this case report, for the first time, to our knowledge, we present a heart transplant patient who was receiving immunosuppressants and developed Influenza A (H1N1) virus infection; we also discuss the role of these drugs in the treatment and consequent clinical outcome of the disease.

Case Report

A 45-year-old female Caucasian patient underwent heart transplantation one year and seven months earlier due to cardiomyopathy secondary to chemotherapeutic agent toxicity. The patient had a history of hypertension, diabetes mellitus, and multiple sclerosis. She received home oxygen therapy via nasal cannula, at a 2 L/min flow, due to a chronic lung disease resulting from recurrent pneumonia and right paralysis of the diaphragm following previous cardiac surgeries. She was receiving immunosuppressive therapy with corticosteroid, cyclosporine and sodium mycophenolate, in addition to medication to control hypertension and diabetes mellitus (oral hypoglycemic agents).

During hospitalization, the patient required non-invasive ventilation support, which was used intermittently. There was progressive improvement of dyspnea and hypoxia, with return to the baseline pattern after approximately seven days. Clinical improvement was accompanied by a reduction in C-reactive protein levels: 101 mg/dL (08/04); 39 mg/dL (08/07); 16 mg/dL (08/12); and 2.25 mg/dL (08/17). In this patient, the C-reactive protein levels maintained during hospitalization. The patient was discharged 14 days after admission in conditions similar to those prior to the infection.
In March 2009, there was an outbreak of Influenza A (H1N1) virus infection in Mexico. It rapidly spread worldwide and, in June 11, 2009, the World Health Organization (WHO) moved the alert level to the highest level of a pandemic. The latest WHO’s data show more than 200 thousand confirmed cases worldwide, almost 60% of which concentrated in the Americas. The exact number of cases in Brazil is not available, since as from July 16, the Ministry of Health has prioritized notification, investigation and treatment only of the cases with Acute Respiratory Distress Syndrome (ARDS) and of people with risk factors for disease complications: obese individuals; pregnant women; immunocompromised individuals; those with chronic diseases; children under two years of age; and the elderly. Until August 22, there were 5,206 confirmed cases of ARDS due to Influenza A H1N1 in Brazil, with a total of 557 deaths.

In this pandemic, a trend has been observed of a greater number of cases of ARDS and deaths among populations at younger age ranges for Influenza A H1N1 than for seasonal influenza; a significant percentage of those (approximately 45%) had no risk factors for complications.

Most of the deaths result from severe pulmonary involvement with rapid progression to ARDS and multi-organ failure. Lung injury is caused, in most of the patients, by an effect of the influenza virus infection itself and not by secondary nosocomial infections. Possible mechanisms include direct injury to the respiratory epithelium by the virus and lesion secondary to the exuberant inflammatory response generated by a storm of cytokines and other inflammatory mediators.

The case reported refers to a heart transplant patient, therefore classified in the population at a higher risk of complications due to immunodepression and a small baseline pulmonary function reserve. At baseline, extensive pulmonary involvement by the infection was identified. Thus, the inflammatory response generated was expected to lead to severe ARDS. However, this was not the outcome observed. Despite worsening of the baseline hypoxia and need for non-invasive ventilation, the patient did not develop respiratory failure or other organ failure.

We believe that the fact that the patient was receiving immunosuppressive therapy may have modulated the deleterious effect that an exacerbated inflammatory response would have generated, thus sparing her from a more severe form of Influenza A H1N1 virus infection. Should this finding be observed in similar cases, it will possibly influence the management of the disease, since immunosuppressive therapy may modulate the pulmonary and systemic inflammatory response that significantly contributes to the complications related to the disease.

References