

## Commentary

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# Antiviral Treatment of Flu: Is a Vicious Circle?

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### Abstract

When assessing the positive effects of antiviral therapy of flu on patients, the natural course of the disease, immunology, epidemiology, and global dimension should not be ignored. With elimination of the pathogen by antiviral drugs, it may eliminate the need to improve the immune response of the host and it may be eventuate to continuing epidemics of influenza.

**Keywords:** Influenza; Flu; Oseltamivir; Disease immunity

Influenza A H1N1 subtype, which has been still circulating after the 2009 pandemic, triggered the disease in susceptible people. Although this subtype added into the triple influenza vaccine, it has been still an important cause of morbidity and mortality, which lead to epidemic. According to data of the Centers for Disease Control and Prevention (CDC) and World Health Organization (WHO), H1N1 subtype has been reported to be the predominant subtype. CDC was reported the hospitalization rates as 1.5 per 100,000. According to the CDC report, rate of pneumonia and influenza-related mortality have remained as 5.8-6.4% between end of December and January 2016. According to WHO data, high incidence rates have been still seen in Western Asia as of the beginning of 2016 [1,2]. So far, a predominance of influenza A (H1N1) pdm09 viruses has characterized the 2015–2016 influenza season in Europe; this virus subtype may cause more severe disease and deaths in adults aged 15–64 years than A (H3N2) viruses. Since week 52/2015, several European countries with sentinel surveillance systems for severe acute respiratory infection (SARI) have reported increasing numbers of cases associated with A (H1N1) pdm09 infection [3].

The reasons of this increase may because of inadequate protective immunity or low vaccinations rates and ineffectiveness of the vaccines. The CDC has reported the effectiveness of the influenza vaccine around 60%. In addition, it has been shown that vaccination reduces the hospitalizations by 50-70%. The protection rate of vaccine fall down after the age of sixty-five. However, there are differences between the results of the studies. Despite much anti-vaccine rhetoric, many health authorities continue to recommend the vaccination especially for risk groups [4]. In that case, can it be any other reasons for increasing rates of influenza infection in recent years? For example, antiviral drugs such as oseltamivir, is it fails to control the disease? Recent trials have shown that especially when started to this drug at the early stage of the disease, the oseltamivir was highly effective and reduces the hospitalization and mortality rates associated with influenza [5,6]. Such effectiveness of oseltamivir has led to widespread use of this drug. Recently, it was reported that the prescription of oseltamivir rate increase of 133% in 2012 according to 2003 [7]. While this widespread use of the drug affects the natural history of viruses on the host, does not cause any changes on response of host immune system to the virus? Elimination of the pathogen by antiviral drugs, may lead to elimination of the need of developing immune response of the host? An animal study showed that antiviral administration led to a significant 5.7-fold decreased production of functional anti-influenza antibodies in the host [8]. According to this theory, the continuance of influenza sensitization in patients who have received treatment can lead to re-infection. This leads to two important results: the continuation of the epidemic; that means cumulative increase in morbidity and mortality and drug resistance.

In the light of this observation and scientific data, theory needs evidence. However, when assessing the positive effects of antiviral therapy on patients, the natural course of the disease, immunology, epidemiology, and global dimension should not be ignored. It can be initiated with revised the indication border of antiviral treatment.

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