

Opinion  
Infectious Diseases,  
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# Delay or Giving Up of Influenza Vaccination Induced by Unscientific Journalism Makes Influenza Outbreak and Its Subsequent Cardiovascular Death Surges Especially in Elderly

Jang-Whan Bae <sup>1,2</sup>

<sup>1</sup>Division of Cardiology, Department of Internal Medicine, Chungbuk National University Hospital, Cheongju, Korea

<sup>2</sup>Department of Internal Medicine, College of Medicine, Chungbuk National University, Cheongju, Korea

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**Address for Correspondence:**

**Jang-Whan Bae, MD, PhD**

Department of Internal Medicine, College of Medicine, Chungbuk National University, 1 Chungdae-ro, Seowon-gu, Cheongju 28644, Republic of Korea.

E-mail: drcorazon@hanmail.net

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**ORCID iDs**

Jang-Whan Bae

<https://orcid.org/0000-0003-1362-9804>

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Coronavirus disease 2019 (COVID-19), which started in Wuhan, China in December 2019, is still in progress globally under the situation of no vaccine or definite treatment developed, and the situation of the Republic of Korea is not so different. Then, the northern hemisphere enters winter season, and spreading period of seasonal influenza starts. Therefore, Korea has the potential to suffer from double troubles of respiratory viral disease, COVID-19 and seasonal influenza together. According to the WHO report, COVID-19 is predicted to have a crude mortality rate of 3%–4% and an infection mortality rate lower than that.<sup>1</sup> According to an announcement by the group of Verity et al.<sup>2</sup> and the China CDC<sup>3</sup> in March, 2020, during the initial COVID-19 outbreak in China, the fatality rate is 0.9% in patients without previous medical illness, 10.5% for patients with cardiovascular disease, and 14.8% for elderly patients over 80 years of age. Older age was an critical independent factor associated with severe infection requiring intensive care unit treatment or use of a ventilator and death.<sup>2,3</sup>

Seasonal influenza can be prevented with a vaccine, and despite the presence of effective antiviral medication, it causes severe infections of 3–4 million and makes 290,000 to 650,000 deaths each year globally, and more than 95% of the deaths are aged 65 or older.<sup>4</sup> The mortality rate of seasonal influenza is about 0.1%, which is quite low compared to that of COVID-19.<sup>1</sup> Unlikely with COVID-19, seasonal influenza has lower case fatality, preventable and treatment modality exists for it, and some people underestimate the public healthcare impact of influenza. However, seasonal influenza is not a benign disease, especially in population with multiple co-morbidities, for example, cardiovascular disease, pulmonary disease, renal impairment, diabetes mellitus, immunocompromised state, and elderly. In the elderly or patients with multiple underlying diseases, as severe infections due to seasonal influenza increase, the likelihood of pneumonia and the need for a ventilator are increased, and hospitalization due to worsening of pre-existing cardiovascular diseases such as heart failure also steeply increases.<sup>5</sup>

If so, will the sudden death relate to acute myocardial infarction or stroke increase after the outbreak of seasonal influenza? Nguyen et al.<sup>4</sup> have shown the temporal relationship between excess of cardiovascular death and outbreak of seasonal influenza in the New York City from 2006 to 2012. According to this data, the associations were strongest for total influenza-like illness (ILI): each increase of 103.2 emergency department visits for ILI was associated with a 6.3% (95% CI, 3.7%-8.9%) rise in cardiovascular disease mortality and a 6.9% (95% CI, 4.0%-

9.9%) rise in ischemic heart disease mortality, both at a lag of 8 to 21 days. Total ILI associations were strongest and most acute for myocardial infarction mortality: each IQR increase was associated with a 13.1% (95% CI, 5.3%-20.9%) increase in myocardial infarction mortality at a lag of 1 to 14 days.<sup>4</sup> Excess cardiovascular mortality related to ILI increment appeared more significantly in population with over 65 years of age than that under 65 years.

Can influenza vaccination reduce the incidence of cardiovascular events, especially myocardial infarction or ischemic heart disease? For this, according to a meta-analysis of 22 clinical studies involving patients over 65 years of age from 1994 to 1995 and 2016 to 2017, influenza vaccination was found to significantly reduce the risk of influenza hospitalization, all-cause hospitalization, and eventually cardiovascular events.<sup>6</sup> In detail, influenza vaccine reduced effectively heart failure and acute coronary syndrome hospitalization for patients 65–74 years of age, and stroke hospitalization for individuals 75 years and older.<sup>6</sup> In other words, seasonal influenza already has a cure and the mortality rate is lower than that of diseases such as COVID-19, but it is still a terrifying disease for patients with multiple underlying diseases, especially elderly cardiovascular disease patients. In addition, influenza vaccination can reduce effectively the incidence of influenza hospitalization, thereby reducing the incidence of ischemic heart disease, myocardial infarction, stroke, and sudden death.

Even if some persons died after receiving the influenza vaccination, most of them were not directly related to the influenza vaccine but were caused by acute exacerbation of the existing disease.<sup>7</sup> However, efforts to find a relationship between vaccine and sudden death through autopsy or epidemiological investigation must be carried out in each case.<sup>8</sup> Of course, raising the issue of the relation between influenza vaccination and sudden death is one of responsibilities of mass media and journalism. However, if journalists without background knowledge about vaccine poured out news about adverse events of influenza vaccination e.g. sudden death after vaccination, unreasonable fear about influenza vaccination would be spread among lay citizens. It may delay or even let them give up of influenza vaccination especially in elderly and population of multiple co-morbidities. Lack of vaccination will make higher incidence of influenza, and subsequent increment of hospitalization of ischemic heart disease, myocardial infarction, and stroke in elderly patients. Fear in citizens for vaccination will be getting bigger according to consecutive small accidents. There were several issues that would make citizens' fear grow about influenza vaccination in this season, for example, the breakage of the cold-chain system during vaccine delivery and precipitation in some lots of vaccines. Reassurance and explanation provided by governmental authorities with easy words and scientific analysis for each accident is very important to assure the scared citizens. But the best way will be planned and considerable preemptive actions which can abort these accidents, and honest promise to prevent recurrence of any mistake by governmental authorities. Strivings for proper vaccination augmentation especially in elderly people provided by journalism, governmental authorities, and professional academic societies can reduce incidence of influenza and related cardiovascular deaths.<sup>9</sup>

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