

## EDITORIAL

## Infectious Disease

# Invited Editorial: Characteristics and outcomes of adverse events following COVID-19 vaccination

In this issue, an article by Kewan et al,<sup>1</sup> "Characteristics and Outcomes of Adverse Events Following COVID-19 Vaccination," describes patients who visited the emergency department (ED) within 10 days following a coronavirus disease 2019 (COVID-19) vaccination. This retrospective study from 11 hospitals in one US healthcare system aims to describe the adverse events of 1842 patients who presented within 10 days following their first or second COVID-19 vaccination. The most common causes of presentation to the ED were trauma, hypertensive emergency/urgency, generalized pain, and arthralgia. The most common causes for admission were hypertensive emergency/urgency, trauma, sepsis, COVID-19 infection, and stroke.<sup>1</sup> This study is an epidemiologic surveillance of ED visits in patients who had received the vaccination, and the findings are descriptive in nature without a control group. The results, therefore, must be interpreted with caution because correlation does not represent causation.<sup>2</sup>

The article is particularly worthwhile given the large number of patients examined across multiple hospitals. If we extrapolate using the 1842 ED patients over the study period, this would result in 3.7% ED visits for the vaccinated population versus a historical 14.3%.<sup>3</sup> This article adds to the existing literature regarding the safety of the COVID-19 vaccination by demonstrating that vaccinated patients visiting the ED are a very low volume and not a burden to the system.

More importantly, the authors point out that they observed higher mortality rates among non-vaccinated patients presenting to the ED, in addition to demonstrating that vaccinated individuals had a lower mortality rate (2.2%) than the unvaccinated (2.6%). The vaccinated in this study also had lower mortality rates than historical data, which noted a mortality rate of 8.3% at 1 month and 17.2% at 6 months in patients ages 65 years or older.<sup>4</sup> The 41 patients in this study who died after vaccination had complex medical histories and likely died of causes unrelated to the vaccination, including several who had cancer diagnoses and died while on comfort care. This study supports previous studies showing that the benefits of the vaccine far outweigh the risks of adverse effects of getting the disease.<sup>5,6</sup> According to the most recent data from the Center for Disease Control at the time this article was written, the weekly rate of hospitalization was 0.1 per 100,000 among the vaccinated compared to 2.52 per 100,000 among the unvaccinated, whereas the weekly rate of death was 0.04 per 100,000 among

the vaccinated compared to 0.96 per 100,000 among the unvaccinated. These data represent a 25-fold risk reduction among the vaccinated.<sup>7</sup>

In summary, this study adds to the existing data from randomized controlled trials that demonstrate that the vaccines are safe.<sup>5,6,8,9,10,11</sup> Most importantly, however, this study demonstrates that mortality was higher among the non-vaccinated. Clearly this study supports that any potential vaccination risk is small compared to the morbidity and mortality of contracting COVID-19.

## CONFLICTS OF INTEREST

The authors declare no conflicts of interest.

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