Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

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COVID-19 vaccine adverse reactions bring patients to emergency departments

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To the Editor

To combat the devastating consequences of the COVID-19 pandemic, vaccines were developed using mRNA carriers and rapidly distributed. As of April 23, 2021, nearly 27.5% of Americans have been vaccinated against COVID-19. Of those that are vaccinated, 66.6% are ≥65 years of age (1).

Side-effects from the COVID-19 vaccine are well-documented. In a recent published letter, anaphylaxis to mRNA COVID vaccines was cited to occur in 2.5 to 11.1 cases per million doses (2). The Centers for Disease Control and Prevention has recommended that the mRNA SARS-CoV-2 vaccines should not be administered to individuals with a known history of a severe allergic reaction to any component of the vaccine (3). Other reported side effects of mRNA vaccines are fevers, myalgias, nausea, vomiting and flu like illnesses. These side effects appear more prevalent than those of the seasonal influenza vaccine and have drawn more attention. In addition, many infectious disease experts believe that COVID-19 vaccines will require an annual booster as immunity may wane over time and the virus mutates. To date there have been no studies regarding ED visits related to the COVID-19 Vaccine. We aim to describe the incidence of emergency department (ED) visits secondary to COVID-19 vaccine reactions within a large healthcare system.

We reviewed the discharge and admit diagnosis of all patients seen between January 23, 2021 and March 14, 2021 across 20 EDs in our healthcare system from the electronic medical record (Epic, Verona, WA). Those with ICD-10 codes related to COVID-19 vaccine reaction were extracted and descriptive statistics performed in Microsoft Excel (Redmond WA).

380 encounters had adverse reaction to COVID vaccine listed as one of their ED diagnosis (Table 1). Of these patients, 85% presented during the day and evening hours and the mean age at time of encounter was 57.5 years. The mean acuity on the Emergency Severity Index (ESI), was 3. In the workup, 70.3% had labs drawn, 61.6% were given IV medications, 45.8% obtained x-ray imaging, and 20.3% patients had CT scans obtained. Eighty-one percent were discharged and 17.9% were admitted. Hospital length of stay for admitted patients was a mean of 3.88 and a median of 2.72 days. The top 3 chief complaints on arrival were shortness of breath (12.6%), chest pain (10.8%), and allergic reaction (10.5%).

While this data encompasses a short time frame, it demonstrates that COVID-19 vaccine reactions may present with high-risk chief complaints to the ED. As a result, many of these patients receive full workups. While it may be easy to dismiss these complaints as vaccine related, the fact that nearly 18% were admitted with a median and mean length of stay longer than a brief period of observation, disputes that assertion. Elderly and those with risk factors present with high-risk complaints. The prudent clinician will consider vaccine side effects as a trigger for potential serious complications and initiate an appropriate workup, while the impudent one will simply label the patient as having a vaccine side effect.

Reporting of "adverse event following immunization" (AEFIs) are usually based on a passive surveillance system. Passive surveillance relies on healthcare providers and vaccinated persons to report side effects after vaccine administration. While this list is not inclusive, the most common high-risk complaints and diagnoses associated with vaccine administration in the past have been Guillain-Barré syndrome, febrile convulsions, seizures, anaphylaxis, and meningitis/encephalitis. Additionally, low risk reactions such as pain at injection site, redness, and local reactions also have been reported. (4) There are no studies on ED encounters related to other vaccines side effects, though anecdotally it appears uncommon. Our preliminary data raises the question of how do we best triage these complaints to ensure that high-risk diagnoses are not missed.

Limitations of the study include the retrospective nature and lack of a detailed chart review as to whether vaccine side effects were the primary reason or incidental to admission. Additionally, it is unknown which vaccine was administered and whether it was the first or second dose.

We recommend that clinicians engage in anticipatory guidance and inform patients of potential adverse events from COVID-19 vaccination. Keeping patients hydrated 24 h after vaccine administration as well as having adequate care at home to mitigate the risk of falls and other adverse side effects are key. Fall risk in the elderly population is exceptionally notable as many patients presented with shortness of breath, fatigue, dizziness, and dehydration.

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Table 1
Percent of Total Encounters.

Time Period: 1/23/2021–4/12/2021		
Emergency Departments: 20		
Descriptive Characteristics of ED Encounters for Adverse Reaction to COVID-19 Vaccine	380	
Arrival Time Period		
7a-2:59p	189	49.7%
3p-10:59p	134	35.3%
11p-6:59a	57	15.0%
Age at Encounter		
Mean	57.5	
Median	60.0	
Gender		
Female	262	68.9%
Male	118	31.1%
Acuity		
Mean	3.0	
Resource Utilization		
CT	77	20.3%
MRI	1	0.3%
US	10	2.6%
X-Ray	174	45.8%
Labs Drawn	267	70.3%
Medications (IV)	234	61.6%
ED Length of Stay (minutes)		
Mean	198.8	52.3%
Median	184.5	48.6%
ED Disposition		
Discharge	306	80.5%
Admit or Transfer	68	17.9%
LBTC	5	1.3%
Expired	1	0.3%
Top 5 Chief Complaints		
Shortness of Breath	48	12.6%
Chest Pain	41	10.8%
Allergic Reaction	40	10.5%
Fever	32	8.4%
Weakness	30	7.9%

Occam's razor non withstanding, emergency physicians are encouraged to approach high-risk chief complaints with prudence in this population. Further research to identify trends and proactively identify the population most at risk is needed.

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Meetings

None.

Declaration of Competing Interest

No disclosures to report.

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