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## Ischemic stroke after covid-19 mRNA vaccination (Pfizer): A case report

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### ABSTRACT

COVID-19 has been linked to more than expected cases of strokes especially in young population. Over a 42-day follow-up period, the BNT162b2 vaccination caused few side effects, majority of it were minors and few are dangerous. This is the second case report which suggest a relationship between COVID-19 mRNA BNT162b2 (Pfizer) vaccine and stroke. Our case is regarding 40-year Saudi women previously healthy, presented to ER with signs and symptoms of weakness in her right side with ipsilateral mild facial palsy and slurred speech ten days after receiving first dose BNT162b2 vaccine. Non-contrast CT scan of the brain demonstrated large fairly defined hypodense area involving the left fronto-temporal region; it exerts a mass effect in the form of effacement in the cortical sulci and mild compression of the ipsilateral ventricle with no shift of the midline structures. In our case, a link between the stroke and Pfizer vaccine is hard to exclude out. The above link has to be investigated further, and people who develop a stroke sooner after getting the first dose should be addressed carefully.

**Keywords:** Case Report, COVID-19, Stroke, Pfizer Vaccine, COVID Pandemic

### 1. INTRODUCTION

Vaccination against COVID-19, the pandemic virus, is quickly spreading over the world; COVID-19 has been linked to a higher-than-expected occurrence of stroke, particularly in young persons, according to several researches (Nogueira et al., 2021). COVID-19 is a disease that affects more than just the lungs; it can also affect other organs, including the brain (Nannoni et al., 2021; Pawar et al. 2021). Over a 42-day follow-up period, the BNT162b2 vaccination caused few side effects. Although the majority of these incidents were minor, some of them, such as myocarditis, could be dangerous (Barda et al., 2021). However, there have been no reports linking the COVID-19 mRNA vaccine, which encodes the SARS-CoV-2 spike glycoprotein, to cerebrovascular illness. We present a case of ischemic stroke following the first dose of BNT162b2 (Pfizer) COVID-19 mRNA immunization.

## 2. CASE PRESENTATION

A 40 years old Saudi female not known to have any medical condition was taken to the emergency department by her family on account of sudden onset of right-sided weakness and slurred speech. The night before the patient went to sleep at 12 p.m and woke up with the aforementioned symptoms, the patient presented to emergency department at 7 a.m. Further evaluation in emergency department revealed the patient is suffering from complete paralysis in her right side with ipsilateral mild facial palsy and dysarthria.

Past medical history is insignificant except for oral contraceptive use for four months and the 1st dose of the Covid-19 mRNA BNT162b2 (Pfizer) vaccine ten days ago. During the physical examination, the patient was confused, pale, and dysarthric. The patient's vital parameters were within normal range. Neurological examination displayed a right-sided central pattern of facial weakness. Strength is 0/5 in the right upper extremity and 5/5 on the left. Strength is 0/5 in the right lower limb and 5/5 on the left. Laboratory investigations as follow Hb was 7 (women, 12.0 to 15.5 grams per deciliter) other labs findings were within the normal range (CBC, electrolytes, and renal function tests).

Non-contrast multi-sliced CT scan of the brain was conducted and it demonstrated a large fairly defined hypodense area involving the left frontotemporal region, it exerts a mass effect in the form of effacement in the cortical sulci and mild compression of the ipsilateral ventricle with no shift of the midline structures (Figure 1). A transthoracic echocardiogram was performed, it showed normal left ventricular diameter with a normal ejection fraction, and no valvular disorders or thrombus can be seen. In ED patient was given aspirin 81 mg, clopidogrel 75 mg, rosuvastatin 20 mg, enoxaparin 40mg and omeprazole 20mg. During hospital admission, further evaluation including carotid Doppler, autoantibody screen, and thrombophilia screen has been performed and all within normal range.



**Figure 1** Illustrating acute ischemic stroke in the left frontotemporal region.

## 3. DISCUSSION

Because the stroke happened in this patient without any known medical illnesses, it's difficult to rule out a link between the COVID-19 BNT162b2 (Pfizer) vaccine and ischemic stroke. Especially she had a stroke after ten days of having the vaccine. In addition, the patient's tests for coagulation were all normal. Also, neither clots nor vegetation were detected by transthoracic echocardiogram.

On the other hand, our patient was taking an oral contraceptive, which is a stroke risk factor (Li et al., 2019), but she had the stroke after 10 days of taking the Pfizer vaccine. Therefore, we don't know if there is any causality between this vaccine and

ischemic stroke based on this case alone or whether the risk of ischemic stroke has been increased after taking the vaccine. This link must be closely examined, and patients who suffer a stroke shortly after the initial dosage must be treated with caution. Also, a high suspicion index is necessary to detect thrombotic events following COVID vaccination during the recent vaccination period.

#### 4. CONCLUSION

Reported cases regarding ischemic stroke after COVID-19 BNT162b2 (Pfizer) vaccine are becoming a global concern. Therefore, our case report emphasizes the value for more investigation and monitoring of such a condition, to illustrate a clear relationship between the COVID-19 mRNA vaccine and ischemic stroke.

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#### Informed consent

Both oral and written informed consent was obtained from our patient.

#### Author contribution

Everyone has participated in writing the manuscript and Data-Collection.

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#### Conflict of interests

The authors declare that there are no conflicts of interests.

#### Data and materials availability

All data associated with this study are present in the paper.

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