Peripheral Facial Nerve Palsy Following BNT162b2 (COVID-19) Vaccination

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During January 2021, we observed a rise in patients admitted to our emergency department with peripheral facial nerve palsy, a large number of whom had been recently vaccinated against severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2). We report on nine cases of a new acute-onset facial nerve palsy that occurred following administration of the BNT162b2 vaccine.

PATIENT DESCRIPTION

ETHICS APPROVAL

All procedures performed involving human participants were in accordance with the ethical standards of the institutional research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

PATIENT 1

An 86-year-old woman with hypertension presented to the emergency department (ED) 14 days following the first dose of the BNT162b2 vaccine with an asymmetric smile. Examination showed facial weakness with partial eyelid closure and corneal punctate epithelial erosions on the left eye. The patient was prescribed oral treatment of glucocorticoid and was advised to use artificial teardrops for several days with temporary closure of the left eyelids at night.

PATIENT 2

A 78-year-old female with a cardiac pacemaker presented with 2 days of ear pain, tinnitus, and a left facial weakness 5 days after receiving the second dose for BNT162b2 vaccine. Physical examination was positive for complete facial nerve palsy on the left side and the patient was discharged with conventional treatment recommendations. Two days later, she returns to the ED with an abrupt periauricular vesicular rash and a bilateral sensorineural hearing loss was demonstrated. She was admitted for further evaluation and antimicrobial treatment was initiated.

PATIENT 3

A 79-year-old male with hypertension and asthma developed right-sided herpes zoster ophthalmicus 4 days after the first injection of the BNT162b2 vaccine. He was treated appropriately and immunized as planned. Two days following immunization with the second dose, he complained of an irregular smile with inability to close the right eyelids and was diagnosed with a pe-

Table 1. Patient characteristics of nine patients with a new onset peripheral facial palsy following vaccination with the BNT162b2 (Pfizer-BioNTech) vaccine

Patient #	Gender	Age, years	Co-morbidity	Laterality	Days following dose 1	Days following dose 2
1	Female	86	Hypertension	Left	14	–
2	Female	78	Cardiac pacemaker	Left	26	5
3	Male	79	Hypertension and asthma	Right	4	–
4	Female	69	None	Right	3	–
5	Female	73	Dyslipidemia	Left	12	–
6	Male	77	Hypertension, stroke, prostate cancer	Left	22	1
7	Male	64	None	Left	7	–
8	Male	51	Hypertension, obstructive sleep apnea, Ménière's disease	Right	30	9
9	Male	35	None	Left	4	–

ripheral facial palsy on the right side. He started oral steroids and was discharged.

PATIENTS 4–9

These patients presented to the ED with a new-onset unilateral face asymmetry. An otherwise normal physical and neurological examination concluded a peripheral facial palsy and a recommendation for steroidal treatment along with artificial tear drops was given on discharge. Their clinical details are further described in Table 1.

COMMENT

Facial nerve palsy has been described as an adverse event following immunization against other pathogens including influenza, hepatitis B, polio, diphtheria-tetanus-pertussis, and acellular pertussis, as well as the measles-mumps-rubella vaccine [1]. Although the mechanism is not fully elucidated, it is thought to involve the additive adjuvants that stimulate an immunomodulatory reaction [2]. The BNT162b2 vaccine creates an immune reaction using a different method, without adjuvants, based on viral spike protein being translated and expressed based on mRNA.

At the time of this writing, SARS-CoV-2 has infected more than 100,000,000 people worldwide. On 11 December 2020, the U.S. Food and Drug Administration issued the first emergency use authorization for a vaccine for the prevention of coronavirus disease-2019 (COVID-19): BNT162b2 (Pfizer–BioNTech). This 2-dose vaccine is administered intramuscularly at a 21-day interval [3].

The results of a well-designed efficacy trial were published. Local and systemic reactions were assessed. Some adverse effects were noted, such as local reactions and systemic events such as fever, fatigue, and headaches. Serious adverse events were reported in four patients among BNT162b2 recipients (n=4/21,621). Notably, peripheral facial nerve palsy was reported only among vaccinated participants (at 3, 9, 37, and 48 days following vaccination). However, analysis of adverse vaccine reactions were limited by the relatively small (n=21,621) cohort and short follow-up [4].

Recently, Israel launched the national vaccination program. As of 1 February 2021, Israel was the leading country in vaccination rates per capita with almost 5 million residents vaccinated in total [5]. All residents of Israel are obligatory members of one of four national health insurance programs and are a part of a national digital health registry system. These factors enabled researchers to have the unique opportunity to report on the first real-world adverse events seen with the BNT162b2 SARS-CoV-2 vaccine.

CONCLUSIONS

To the best of our knowledge, this is the first report describing several cases of peripheral facial nerve palsy following administration of the BNT162b2 SARS-CoV-2 vaccine in real world data. These results are preliminary and possibly anecdotal incidents and no cause and effect can be concluded at this time. Yet, this report raises an important and timely issue. The authors maintain that the BNT162b2 vaccine remains safe. Further surveillance using real-world data is encouraged into this possible immune related phenomenon.

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Capsule

Macrophages seal 'em in the coelom

GATA6$^+$ macrophages resident in body cavities exhibit both phagocytic and repair functions. However, the mechanisms by which these cells can identify and migrate to sites of injury have remained unclear. Using intravital imaging of mouse peritoneal cavities, **Zindel** and colleagues reported that GATA6$^+$ macrophages rapidly assemble clot-like structures in a process strongly analogous to thrombosis. The formation of these aggregates requires the expression of macrophage scavenger receptor domains and acts to plug wounds and promote healing. This pathway can be inadvertently activated during medical procedures, when macrophage aggregates can promote the generation of abdominal scar tissue known as adhesions. Inhibition of macrophage scavenger receptors may therefore be a useful therapeutic approach after surgeries that cause injury to body cavities.

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