

Sequential contralateral facial nerve palsies following COVID-19 vaccination first and second doses

Abigail Burrows, Theo Bartholomew, James Rudd , David Walker

ENT, Royal Surrey County
Hospital NHS Foundation Trust,
Guildford, UK

Correspondence to
Dr Abigail Burrows;
abigail.burrows@nhs.net

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SUMMARY

A 61-year-old man presented to the ENT emergency clinic with a history of unilateral facial nerve palsy occurring shortly after each dose of the Pfizer-BioNTech COVID-19 vaccine. The first episode developed 5 hours after administration of the first dose and the second 2 days after administration of the second dose. Investigations at initial presentation to the emergency department were unremarkable, and the patient was diagnosed with Bell's palsy on both occasions. We describe the first case of Bell's palsy occurring after each dose of any UK-approved COVID-19 vaccine. Single episodes of unilateral facial nerve palsies have been reported in clinical trials and in subsequent case reports. There has been no evidence, however, of an episode after each dose. We also describe the earliest onset of symptoms from timing of administration of the vaccine, further suggesting the Bell's palsy was associated with the vaccine.

BACKGROUND

Adverse effects of the novel COVID-19 vaccinations are ever-evolving and receiving significant attention both in medical journals and the media.^{1 2} Unilateral facial nerve palsies were reported in the initial clinical trials of all three major vaccines approved for use in the UK.³⁻⁵

In the Pfizer-BioNTech mRNA phase 3 vaccine trial there were four reported cases of Bell's palsy in the vaccine arm compared with zero cases in the placebo arm from a total of 38 000.⁶ This was reported as no higher than the expected incidence in the general population and a causal relationship was therefore not established. The cases occurred at 3, 9, 37 and 48 days post-vaccination. One case completely resolved while the other three were described as resolving or continuing as the data collection terminated. The FDA recommends continued surveillance for Bell's palsy as vaccine distribution continues, and the UK government website lists facial drooping as a potential side effect for the Pfizer-BioNTech vaccine in one in 1000 people.⁵ In the UK there have been 291 cases of facial paralysis associated with the Pfizer-BioNTech vaccine reported from 9 December 2020 to 5 April 2021 via the yellow card reporting system.⁷ The MHRA comments that this number is similar to the expected rate in the population; however, they are continuing to monitor the reports.

In the Moderna mRNA COVID-19 vaccine phase 3 trials, there were four reported cases of Bell's palsy: three in the vaccine arm and one in the placebo arm involving over 30 420 participants

randomised on a 1:1 basis.⁸ There were six cases of facial nerve palsy reported in the safety analysis set for the COVID-19 Oxford/AstraZeneca vaccine trials: three in the vaccine arm of 12 021 participants and three in the placebo arm of 11 724 participants.^{4 9} A recent disproportionality analysis using the WHO pharmacovigilance database showed no difference between the reporting rate of facial nerve paralysis with COVID-19 mRNA vaccines when compared with other viral vaccines.¹⁰

Unilateral facial nerve palsies occurring after each COVID-19 vaccine dose were not reported in any of the three vaccine trials, nor has this been reported in the literature.

CASE PRESENTATION

We present the case of a 61-year-old Caucasian man who presented with two discrete contralateral episodes of Bell's palsy shortly after receiving his first and second doses of the Pfizer-BioNTech COVID-19 vaccine. The patient had a background of hypertension, hypercholesterolaemia and insulin-dependent type 2 diabetes. The individual had a body mass index of 29 kg/m² and a recent HbA1c of 77 mmol/mol (typical diabetic target 48 mmol/mol), but no known microvascular diabetic complications. There was no previous history of facial nerve palsy. Regular medications included amlodipine, ezetimibe, Lantus and NovoRapid. There were no known drug allergies or previous reactions to vaccines. The patient tested negative for COVID-19 antibodies on 16 June 2020.

The patient initially developed right-sided facial weakness 5 hours after the first dose of the Pfizer-BioNTech vaccine on 18 January 2021 and presented to the local emergency department the next day. On examination, there was a right-sided lower motor neuron facial palsy with incomplete eye closure and no forehead movement; however, a House Brackmann score was not documented. Routine bloods were unremarkable and a CT head showed no acute pathology. The patient was diagnosed with Bell's palsy and discharged with a 60 mg dose of prednisolone and subsequent weaning dose over a 4-week period. Following steroid treatment, the right-sided facial nerve palsy completely resolved. The patient was booked for a routine second vaccine.

Six weeks after administration of the first vaccine, the patient received the second dose of the Pfizer-BioNTech vaccine. Two days later the patient developed a more severe left-sided facial nerve palsy. He attended the emergency department again and was prescribed a 7-day course of 60 mg prednisolone



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with referral to the emergency ENT clinic as follow-up. Both doses of the vaccine were administered in the left arm.

The patient was reviewed in our clinic 7 days after the onset of symptoms and following 1 week of high-dose steroid treatment. He described symptoms of dribbling and dysphagia, with this episode being more severe than the last. On examination there was a severe left-sided facial nerve palsy of House Brackmann grade 4 with incomplete left eye closure and the Sunnybrook Facial Grading System was 13. The House Brackmann scale is a tool used to describe the severity of facial nerve paralysis, with grade 1 being normal and grade 6 representing total paralysis.¹¹ The Sunnybrook Facial Grading System is a more extensive descriptor incorporating resting symmetry, synkinesis and symmetry of voluntary movement.¹² Remaining neurological examination and gait were normal. The patient was continued on steroids for one further week, referred urgently to ophthalmology and booked for a 6-week review in ENT.

OUTCOME AND FOLLOW-UP

The patient was followed up with a telephone call 2 weeks later when he reported that the symptoms had greatly improved and had almost returned to normal. The patient has been advised to discuss future mRNA vaccines with the GP on a case-by-case basis, taking into account risk versus benefit of having each vaccine.

DISCUSSION

Bell's palsy is defined as a rapid unilateral facial paresis or paralysis of unknown cause.¹³ Although the aetiology is unclear, the pathogenic mechanism is believed to be related to facial nerve inflammation and oedema caused by a virus. Most patients show some recovery without intervention in 2–3 weeks and the majority of cases resolve within 3–4 months. Risk factors include diabetes, obesity, hypertension, pregnancy, pre-eclampsia and upper respiratory disease.¹³ Although most cases spontaneously recover with time, the symptoms can cause significant temporary disability for patients, affecting their facial expression and ability to eat and drink. Long-term facial weakness can lead to significant morbidity along with high rates of anxiety and depression.¹⁴

Bell's palsy has previously been linked with influenza vaccinations. In 2004 the inactivated intranasal influenza vaccine was shown to significantly increase the risk of Bell's palsy and was discontinued.¹⁵ Increased incidence of Bell's palsy has also been described with administration of other multiple influenza and meningococcal vaccines, although a causal link has not been established.¹⁶

A possible mechanism of action could involve reactivation of the dormant virus within the CNS causing facial nerve inflammation or oedema after administration of the vaccine. A proposed mechanism of idiopathic facial nerve palsy suggests reactivation of latent herpes virus in a similar mechanism to Ramsey Hunt syndrome and the reactivation of the varicella zoster virus.¹⁷ Autopsies have also confirmed that COVID-19 viral RNA is present in the CNS.¹⁸ However, we are unable to account for the rapid onset of the facial nerve palsy.

A review of the current literature produced two formal case reports of unilateral facial nerve palsy occurring after receiving the Pfizer-BioNTech COVID-19 vaccine. In Los Angeles, a 57-year-old woman developed a severe Bell's palsy 36 hours after administration of her second dose of vaccine.¹⁹ The dose was given 19 days after the first dose. The patient had a left-sided facial palsy and improved with an antiviral and steroid. Of note, the patient had a history of three previous episodes of Bell's

palsy which had affected her on both sides. Similarly, a unilateral facial nerve palsy was reported in a healthy Italian 37-year-old man, occurring 5 days after his first dose of vaccine. The patient had no significant past medical history or previous Bell's palsy and made some improvement with high-dose steroids.²⁰

We describe the first case of two discrete contralateral facial nerve palsies to be reported in the literature following both doses of the Pfizer-BioNTech vaccination. This case also describes the earliest onset of symptoms after administration of the vaccine compared with the two aforementioned cases and those within the clinical trials. The occurrence of the episodes immediately after each vaccine dose strongly suggests that the Bell's palsy was attributed to the Pfizer-BioNTech vaccine, although a causal relationship cannot be established.

Learning points

- ▶ Given the rapid roll out of the COVID-19 vaccine, it is essential that clinicians are vigilant and report adverse effects in a timely manner.
- ▶ Our case is the first reported incidence of two discrete contralateral episodes of Bell's palsy shortly after receiving his first and second doses of the Pfizer-BioNTech COVID-19 vaccine.
- ▶ The current data from clinical trials do not wholly comment on relevant medical history or previous cases of Bell's palsy in those who suffered side effects.
- ▶ Healthcare professionals should continue to report and share these findings in order to further investigate the potential of a causal relationship and the pathophysiology underlying Bell's palsy. A longitudinal cohort study could be used for further analysis of these cases.

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ORCID iD

James Rudd <http://orcid.org/0000-0002-9976-2376>

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