

## CASE REPORT

# The great pretender—Bell's palsy secondary to SARS-CoV-2?

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**Abstract**

This case series highlights a possible association between isolated facial nerve palsy and SARS-CoV-2. Caution should be exercised in the use of steroids in patients with COVID-19 as its impact is still not well established.

**KEYWORDS**

Bell's palsy, COVID-19, cranial nerve, facial nerve, facial nerve palsy, SARS-CoV-2

## 1 | INTRODUCTION

Neurological manifestations secondary to severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) are increasingly identified. Two patients with SARS-CoV-2 presented with acute facial nerve palsy without other neurological or respiratory symptoms. They were treated with corticosteroids and antivirals with improvement. This series highlights a possible association between isolated facial nerve palsy and SARS-CoV-2.

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) predominantly causes respiratory and gastrointestinal disease. However, as this global pandemic evolves, there are increasing reports of neurological involvement. Experimental models suggest that human coronaviruses have neurotropism, with emerging reports that SARS-CoV-2 may have a greater affinity for the nervous system than its earlier counterparts.<sup>1</sup> Herein, we present two cases of Bell's palsy in patients with SARS-CoV-2.

## 2 | CASE REPORTS

Two patients presented acutely with unilateral facial weakness, with no concomitant or prior acute respiratory illness (ARI)

(details are summarized in Table 1). Both patients had a lower motor neuron pattern of facial nerve weakness—that is, weakness of the affected frontalis, incomplete eye closure, and unilateral facial droop, with no hearing loss, vertigo, headache, hyposmia, or other neurological deficits. Neither demonstrated vesicles on the ear or palate, parotid masses, nor respiratory symptoms. SARS-CoV-2 testing was performed as part of epidemiological investigations. Patient 1 had a nasopharyngeal swab done at presentation, which was positive for SARS-CoV-2 using reverse-transcription polymerase chain reaction (RT-PCR), and subsequent SARS-CoV-2 IgG was negative, indicating early infection. In contrast, patient 2 was positive for SARS-CoV-2 IgG eight days prior to presentation (performed as part of screening). All imaging was unremarkable for both patients. They were commenced on oral corticosteroids, valaciclovir, and given eye care advice. One month from onset, patient 1 had complete resolution of facial nerve palsy. Patient 2 described symptomatic improvement, though partial recovery was noted.

## 3 | DISCUSSION

Neurological manifestations of SARS-CoV-2 include a spectrum of disease from mild symptoms such as hyposmia and

This manuscript is dedicated to the memory of one of the contributing authors, Dr Jeremy Chung Fai Ng, who passed away on 4 July 2020.

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**TABLE 1** Demographics and features of COVID-19 patients with Bell's palsy

No.	Age (yrs)	Race	Gender	Presentation	Facial HB grade	Duration of facial weakness at presentation (days)	Days from diagnosis of COVID-19 <sup>a</sup>	SARS-CoV-2 RT-PCR	SARS-CoV-2 IgG	HB grade at 1 mo
1	25	Burmese	M	Left facial weakness	V	3	0	+	-	I
2	34	Indian	M	Right facial weakness	IV	2	8	-	+	III-IV

Abbreviations: “-”, negative; “+”, positive; HB, House-Brackmann grading scale; M, male; RT-PCR, reverse-transcription polymerase chain reaction; SARS-CoV-2, severe acute respiratory syndrome coronavirus 2; Yrs, years.  
<sup>a</sup>Duration from first diagnosis of SARS-CoV-2 diagnosis via serological markers or RT-PCR.

hypogeusia to severe manifestations including acute cerebrovascular disease, encephalitis, and acute polyneuropathies including Guillain-Barre syndrome (GBS).<sup>1</sup> While the exact pathogenesis remains unknown, postulated mechanisms include trans-cribri-form spread, misdirected immune responses via immune mimicry, transsynaptic transfer, and possibly brainstem involvement.<sup>1</sup>

Bell's palsy is a common cause of lower motor neuron facial neuropathy. Its exact pathogenesis remains unknown, though potential contributing mechanisms include infection, nerve compression, and autoimmune disease.<sup>2</sup> This may be contrasted with the Ramsay Hunt syndrome in which patients not only have facial nerve palsy but may also have otalgia and a vesicular rash of the auricle. In addition, the varicella-zoster virus may also cause involvement of the cochlear and vestibular nerves, resulting in sensorineural hearing loss or vertigo.<sup>3</sup> In this case, facial nerve palsy may have been triggered by acute infection as the patients were otherwise asymptomatic.

A previous case report described a patient with facial diplegia, an atypical variant of GBS, ten days following COVID-19 infection, possibly a postviral syndrome.<sup>4</sup> Homma et al described a patient with ARI symptoms, olfactory disturbance, and mild facial nerve palsy, though the exact temporal sequence was not described.<sup>5</sup> To our knowledge, these two cases are the only two in literature with isolated facial nerve involvement without other neurological deficits nor ARI symptoms. Further cases would be helpful to elucidate the exact pathogenesis of facial nerve palsy in COVID-19.

The use of corticosteroids in COVID-19 is controversial. The Randomised Evaluation of COVID-19 Therapy (RECOVERY) Trial preliminarily reported reduced mortality with dexamethasone in patients on mechanical ventilation or supplemental oxygen.<sup>6</sup> Conversely, a meta-analysis showed that corticosteroid use in influenza pneumonia was associated with increased mortality and secondary infections.<sup>7</sup> In Bell's palsy, the efficacy of corticosteroids is well-established.<sup>8</sup> In the case described by Homma et al, the patient was treated with traditional medication and favipiravir in view of her worsening respiratory symptoms. Systemic steroids had been avoided as the patient's neurological symptoms were mild and her respiratory symptoms had worsened during the admission.<sup>5</sup> In our series, the patients were otherwise asymptomatic and were administered steroids while monitored inpatient. One patient had full recovery within 1 month. However, the authors advocate that caution be exercised in patients with more severe respiratory symptoms as the impact of steroids in COVID-19 is still not well understood.

## 4 | CONCLUSION

The authors would like to highlight a possible association between Bell's palsy and SARS-CoV-2, possibly a

para-infectious phenomenon, although more cases would be required to support causality. The use of steroids in COVID-19 remains controversial and may be used with caution in patients with mild respiratory symptoms.

### CONFLICT OF INTEREST

The authors declare that they have no conflicts of interest or financial disclosures to declare.

### AUTHOR CONTRIBUTIONS

All authors: contributed significantly to the conception, writing, and review of the manuscript.

### DECLARATION

No identifiable data are included in this study, and informed consent was waived.

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