Perspectives

COVID-19 vaccines and the risk of Bell's palsy

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Background

Global yearly incidence of Bell's palsy varies between 15 to 30 per 100,000 persons[1] and has been reported following viral infections and immunisations[2]. Although initially thought that COVID vaccines did not confer an increased risk[3], recent studies report an increased incidence of Bell's palsy following vaccination. Which of the COVID vaccines confer a greater risk of Bell's palsy and the risk of relapse following the second vaccine dose is currently unknown. Lessons learnt from a patient presenting with vaccine related Bell's palsy and review of published literature are highlighted here to present a perspective on Bell's palsy associated with SARS-CoV-2 vaccination.

Case history

A 60-year-old healthy Sri Lankan woman developed difficulty in closing her right eye associated with right-sided facial sagging and drooling ten days after receiving the first dose of ChAdOx1-S (Covishield-Astra Zeneca vaccine). She did not have a history of fever, earache or blisters in her right ear. On examination, a right-sided lower motor neuron seventh cranial nerve palsy was evident (House-Brackmann[4] score 3). Rest of the neurological examination was normal. Nerve conduction studies confirmed a right lower motor type facial nerve palsy (right facial nerve motor conduction amplitude of 810 μV vs 1.55 mV in left, motor conduction latencies right 3.66 ms vs left 3.06 ms). Gadolinium-enhanced MRI and MRA of her brain were normal. She was treated with 1mg/kg/d of oral prednisolone for 5 days, physiotherapy and eye care. She made a full clinical recovery after one month. However, she could not have the second dose of ChAdOx1-S vaccine due to unavailability. Five months following recovery, she received two doses of inactivated SARS-CoV-2 vaccine (BBIBP-CorV:Sinopharm) 4 weeks apart without any complications.

Discussion

Occurrence of Bell's palsy 10 days after receiving the COVID vaccine in the absence of other known aetiological factors favours a diagnosis of vaccine related Bell's palsy in our patient. Although the pathophysiology of Bell's palsy following SARS-CoV-2 vaccination remains unclear, there are several postulated mechanisms. High titre of spike protein antibodies and a high CSF:serum antibody index detected in patients developing Bell's palsy after Pfizer-BioNTech mRNA vaccines[5] suggest immunological mechanisms causing facial nerve damage. Activation of interferons[5] and auto-immunity due to molecular mimicry by vaccine antigens[2], reactivation of the dormant virus within the CNS are suggested other possible mechanisms. Interestingly Bell's palsy has been reported following all types of first generation vaccines platforms currently approved for the prevention of SARS-CoV-2 infection (mRNA vaccines: Pfizer-BioNTech[6,7,8,9,10] and mRNA-1273 Moderna[3]; viral vector vaccines: ChAdOx1-S-Oxford Astra Zeneca[6,11] and Ad26.CoV2.s-Janssen[12]; and inactivated viral vaccines: Coronovac[7]). Table 1 summarizes the incidences and the risks of developing Bell's palsy related to COVID-19 infection and the different vaccine platforms.

The variations of reported incidences of Bell's palsy among the studies are likely to reflect the differences in predisposition for Bell's palsy in different settings rather than the type of vaccine platform. Although COVID vaccination appears to be associated with a higher incidence of Bell's palsy compared to that of the normal population, currently there is inadequate evidence to suggest that one vaccine poses a greater risk than another[14]. Furthermore, the risk of Bell's palsy is several fold higher following COVID-19 infection than in the normal population and after vaccination.

There is only a single case report of sequential recurrence of Bell's palsy following the first and second dosses of COVID vaccination in which the platform was a mRNA vaccine[15]. Our patient had no recurrence even though she received two further doses of COVID vaccination. The delay and the change of vaccine platform in our patient was due to logistical issues of the vaccine rollout rather than design.

Conclusions

Currently, there is not enough data to choose one vaccine over another to mitigate the risk of Bell's palsy. Vaccine associated Bell's palsy is likely to recover completely as seen in our patient despite a marked neurophysiological deficit at disease onset. The risk of recurrence with repeated doses of vaccination is likely to be low. The risk of Bell's palsy is markedly higher following COVID-19 infection than after vaccination. Given the morbidity and mortality of COVID-19 infection, the benefits of vaccination far outweigh its risks.

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Table 1. Incidences and risks of Bells' palsy in relation to COVID-19 infection and currently used vaccine platforms

	Incidence of Bell's palsy	*Risk of developing Bell's palsy*	*References*
COVID-19 infection	• 82 per 100,000	• Relative risk 6.8 (95% CI=3.5-13.2, <.001)	(13)
mRNA vaccine (Pfizer)	• 89 per 100,000 per year/13.6 per million doses administered[6]	• Israel case control study: Odds ratio 0.84 (95% CI, 0.37-1.90; p=.67)[8]	(6) to (10)
	• 21 per 100,000 in phase 3 clinical trials[9,10]	• Hong Kong nested case control study: Odds ratio 1.755 [0.886-3.77]; p=0.119	
	• 42.8 per 100,000 person-years (Hong Kong)[7]		
Viral vector vaccine (Astra Zeneca)	• 4.1 per million doses administered[6]	• Data not available	(6), (11)
	• 3 in vaccine group across 4 clinical trials out of 23,745 participants[11]		
Inactivated viral vaccine (Coronovac)	• 66.9 cases per 100,000 person-years (Hong Kong)	• Hong Kong nested case control study: Odds ratio 2.385 [95% CI 1.415-4.022]; p=0.0011)	(7)
Normal population	• 15-30 per 100,000 per year		(1)

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