

Facial Palsy in A Young Following Meningococcal Vaccine: A Concerning Connection

Dr. Ishwariya¹, Dr. Madhan Raja.SVRS², Dr. Jude Vinoth.V³

EMERGENCY RESIDENT, APOLLO HOSPITALS, MADURAI¹

CONSULTANT, APOLLO HOSPITALS, MADURAI.²

SENIOR CONSULTANT AND HEAD OF THE EMERGENCY DEPARTMENT, APOLLO HOSPITALS, MADURAI.³

Abstract:

The objective is to highlight an uncommon adverse effect following meningococcal vaccination when administered along with other vaccines. Bell's palsy is due to the inflammation of the facial nerve because of several causes for instance idiopathy, cold exposure, infections, etc. It is important for clinicians to know about the concerning connection between the meningococcal vaccine and bell's palsy when combined with other vaccines.

Keywords : meningococcal vaccine, bell's palsy, facial nerve

Date of Submission: 06-10-2022

Date of Acceptance: 19-10-2022

I. Introduction

Bell's palsy is the most common acute mono-neuropathy due to the inflammation of the seventh nerve in its course through the temporal bone, particularly the labyrinth part, which can lead to pressure on the nerve and disruption of blood flow leading to temporary or permanent nerve damage.[7] It is often self-limited but causes temporary facial weakness and inability to close the eyelid, increasing the risk of eye injury. As it is a clinical diagnosis, clinicians ought to assess the patient through history and physical examination to exclude an identifiable cause. Although the exact cause of Bell's palsy is not known, viral infections including herpes simplex virus, herpes zoster virus and cold exposure are the most credible causes of this defect. In patients more than 16 years, treatment involves prescribing oral steroids within 3 days of symptom onset. There is no effect for oral antiviral therapy alone for patients with Bell's palsy, and protection of the eye should be done with eye closure. The manifestation of Bell's palsy has been interconnected with vaccine administration. Bell's palsy as an adverse effect has been documented following the administration of the meningococcal conjugate vaccine. [7] This occurrence is a statistically significant adverse effect according to the study on the **safety of the quadrivalent meningococcal conjugate vaccine in 11- to 21-year-olds** done by the American academy of pediatrics.

II. Case Report

We report a case of an otherwise healthy 21-year-old male who developed facial palsy within 3 hours after meningococcal vaccination when administered along with other vaccinations. Informed consent from this particular patient has been obtained.

A 21-year-old male received his first injection of MMR vaccine on July 7th and Tdap on July 8th following the meningococcal vaccination on July 10th, the patient noted deviation of mouth to left side within 3 hours. He presented to ER with a left-sided facial droop, with flattening of the nasolabial fold and forehead's skin ipsilaterally. Lagophthalmos was also noted (failure to close the eyelid on the affected side). No history of trauma, preceding infection, cold exposure and identifiable triggers was reported. There was no evidence of a cutaneous rash indicating herpes zoster infection. The clinical diagnosis was bell's palsy most likely due to vaccination. Our patient was started on IV steroids (hydrocortisone), antihistamines, gastroprotective and other supportive measures. On day 2 he showed partial clinical improvement. {fig 1}



FIG 1: patient on day 2

He was followed with oral steroids (methyl prednisone, 16mg/day), eye drops (artificial tears), eye dressing at night and multivitamins.

There was a drastic improvement noticed in the patient after 2 weeks [fig2]



FIG 2

III. Discussion

Bell's palsy was first narrated by a Scottish anatomist, Sir Charles Bell, the common age group includes 15 to 45 years, and the incidence is 11.5 to 53.3 per 100,000 people per year (7). Bell's palsy, is also known as idiopathic peripheral facial nerve paralysis or paresis of acute onset. The sudden onset of inability to close their eyes, dribbling of saliva from the angle of his mouth, and asymmetrical face are clinically suggestive of LMN type of facial palsy. The Bell phenomenon is that the eyeball turns up and out while attempting to close the eye. Contributors to the development of Bell's palsy include infective, immune and ischemic mechanisms. However, the exact mechanism remains unclear. Nerve excitability tests are done on alternative days to monitor nerve degeneration. The choice of drug is Prednisolone. If the treatment is initiated within a week the adult dose is 1mg/kg/day. If the paralysis is recovering tapering of the dose can be started after 5 days. Nerve decompression, surgical management that relieves pressure on the nerve fibers and thus improves the microcirculation of the nerve is also available (3). Meningococcal disease is the clinical manifestation of invasive infection with the gram-negative diplococci *Neisseria meningitidis*. It colonizes the nasopharynx and spreads through respiratory secretions or aerosolized droplets of respiratory fluids [4]. The mechanism of Bell's palsy after vaccination is unclear. One hypothesis is that Bell's palsy is due to an autoimmune phenomenon and can also be secondary to immune-mediated segmental demyelination, through the mimicry of host molecules by vaccine antigens or the

activation of reactive dormant T cellssimilar to Guillain-Barré syndrome. Pfizer-BioNTech and Moderna were the most commonly reported vaccines in case reports of Bell’s palsy.[8]

A case series in 2000-2001 uncovered an increased occurrence of Bell’s palsy amid the recipients of the intranasal inactivated influenza vaccine (with a significant odds ratio of 84%). This occurrence was believed to be due to the interaction of heat-labile *Escherichia coli* toxin found in the intranasal vaccine with the facial nerve. Another mechanism is the reactivation of latent herpes simplex type 1 infection. Whatever the cause is, the clinicians are not supposed to obtain routine laboratory or diagnostic testing in patients with new-onset Bell’s palsy as per the recommendation. (7)

The occurrence of bell’s palsy following the meningococcal vaccination is a statistically significant adverse effect according to the study on the safety of the quadrivalent meningococcal conjugate vaccine in 11- to 21-year-olds published by the American Academy of Pediatrics. Some of the adverse effects of the meningococcal vaccine include Encephalitis and encephalopathy, Guillain-barré syndrome, Chronic inflammatory disseminated polyneuropathy, Anaphylaxis, Multiple sclerosis, etc.[4]

The study by the American academy of pediatrics included 48 899 vaccinated individuals. No cases were observed in the risk window for 14 of 26 years. The RI for Bell’s palsy was statistically significant (adjusted RI: 2.9, 95% CI: 1.1–7.5). Stratified analyses revealed a greater risk for Bell’s palsy in subjects receiving concomitant vaccines (RI = 5.0, 95% CI = 1.4–17.8), and no increased risk for those without concomitant vaccine (RI = 1.1, 95% CI = 0.2–5.5).[1] There is a temporal association between Bell’s palsy and the receipt of menace-CRM concomitantly with other vaccines. [1]

Vaccine Type	N (%)	Male	Female
Pfizer-BioNTech	22 (66.7)	10 (71.4)	8 (53.3)
Moderna	7 (21.2)	2 (14.3)	5 (33.3)
Janssen(Ad26.COV2.S)	1 (3.0)	-	1 (6.7)
COVAXIN	1 (3.0)	1 (6.7)	-
Sputnik V (recombinant vector-based: Ad26, Ad5)	2 (6.1)	1 (7.1)	1 (7.1)
Paralysis			
Right-side	9 (27.3)	5 (35.7)	4 (26.7)
Left-side	16 (48.5)	8 (57.1)	8 (53.3)
Two-side	1 (3.0)	1 (7.1)	-
Not-mentioned	7 (21.2)	-	3 (20.0)
The interval between receiving vaccine and onset of facial weakness (Days)			
Minimum	1	1	1
Maximum	48	21	32
Mean	10.25	6.50	10.03

Table 1: A few vaccines associated with bell’s palsy(4)

Another case-series analysis, a post-marketing study by Tseng et al conducted at Kaiser Permanente Southern California (SCK) from September 2011 to June 2013 found a statistically significant association with Bell's palsy when Menveo(meningococcal vaccination) was administered alongside other vaccines but no association was found when the vaccine was given alone.

IV. Conclusion

Although the mechanism is unclear there is a temporal association between bell’s palsy and meningococcal vaccination when administered along with other vaccines. Clinicians should think of this concerning connection while facing the cases of Bell’s palsy.

Reference

- [1]. 2017 Jan;139(1):e20162084; DOI: 10.1542/peds.2016-2084./ PMID: 28025240
Safety of Quadrivalent Meningococcal Conjugate Vaccine in 11- to 21-Year-Olds
Hung-Fu Tseng¹, Lina S Sy², Bradley K Ackerson³, Rulin C Hechter², Sara Y Tart
- [2]. Hum Vaccin Immunother. 2018; 14(5): 1175–1178.
Published online 2017 Nov 8. Doi: 10.1080/21645515.2017.1366393/PMCID: PMC5989904
Current safety issues with quadrivalent meningococcal conjugate vaccines
- [3]. <https://medicostimes.com/dhinga-ent-pdf/>
- [4]. Adverse Effects of Vaccines: Evidence and Causality
Committee to Review Adverse Effects of Vaccines; Institute of Medicine
PMID: 24624471 Bookshelf ID: NBK190024 DOI: 10.17226/13164

- [5]. CDC (Centers for Disease Control and Prevention). Prevention and control of meningococcal disease—recommendations of the Advisory Committee on Immunization Practices (ACIP). *Morbidity & Mortality Weekly Report*. 2005;54(RR7):1–10. 11–11. [pubmed]
- [6]. Baugh RF, Basura GJ, Ishii LE, et al. Clinical practice guideline: Bell's palsy. *Otolaryngol Head Neck Surg*. 2020;149(3 Suppl): S1–27. [pubmed] [Google Scholar]
- [7]. Bell's Palsy After 24 Hours of mRNA-1273 SARS-cov-2 Vaccine
Haris Iftikhar, SyedaMishkaat U. Noor, Maarij Masood, Khalid Bashir
Published: June 26, 2021 (see history) / **DOI:** 10.7759/cureus.15935
- [8]. *Med J Islam Repub Iran*. 2022; 36: 85./ Published online 2022 Jul 30. DOI: 10.47176/mjiri.36.85PMCID: PMC9448503
PMID: 36128311
- [9]. Bell's Palsy and COVID-19 Vaccination: A Systematic Review

Dr. Ishwariya, et. al. "Facial Palsy in A Young Following Meningococcal Vaccine: A Concerning Connection." *IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)*, 21(10), 2022, pp. 39-42.