

CASE REPORT

Open Access



Hypoglossal nerve palsy after SARS-CoV-2 vaccination – report of two cases

J. Panholzer, L. Kellermair and C. Eggers*

Abstract

Background: SARS-CoV-2 vaccination is associated with an increased risk for Bell's palsy and some other neurological disorders assumed to be of autoimmune origin. While facial nerve palsy is frequent and usually idiopathic, hypoglossal nerve palsy is rare, and a specific cause is almost always found. We firstly report two patients who developed isolated hypoglossal nerve palsy shortly after SARS-CoV-2 vaccination.

Case presentation: Two otherwise healthy patients, a 49-year-old man and a 39-year-old woman, developed unilateral hypoglossal nerve palsy 10 and 7 days after the second SARS-CoV-2-vaccination (AstraZeneca and BioNTech/Pfizer), respectively. In both subjects, needle electromyography showed denervation and rarefaction of motor units. CT, MRI, examination of blood and CSF as well as ENT exam were unremarkable. In both subjects symptoms gradually improved.

Conclusion: Due to close temporal relationship, the absence of other etiologies, and spontaneous improvement we suspect the vaccination as the cause for hypoglossal nerve palsy in both patients. This is further supported by the rarity of isolated hypoglossal nerve palsies, especially in idiopathic cases. We suggest the addition of hypoglossal nerve palsy to the list of neurological injuries potentially caused by SARS-CoV-2 vaccination.

Keywords: Hypoglossal nerve palsy, SARS-CoV2 vaccine, Autoimmune disorder

Background

Vaccination-induced neurological disorders have long been recognized and are thought to be of autoimmune origin. SARS-CoV-2 vaccination has recently been shown to carry an increased risk for facial nerve palsy, Guillain-Barré syndrome and myasthenic disorders [1]. Facial nerve palsy is the most common cranial nerve palsy with an incidence of 7–40 cases per 100 000 persons per year, and its idiopathic form (Bell's palsy) makes up for 60–75% of cases [2]. Hypoglossal nerve palsy, on the other hand, is rare. We first report two patients who developed isolated hypoglossal nerve palsy shortly after SARS-CoV-2 vaccination.

Case presentation

Two otherwise healthy patients, a 49-year-old man and a 39-year-old woman, noted difficulties in moving chyme with their tongue. Symptoms occurred ten and seven days, respectively, after their second vaccination for SARS-Cov-2. The first patient received a vaccine from AstraZeneca, the second patient one from BioNTech/Pfizer. On examination there was marked left-sided deviation of the tongue in both patients (Fig. 1). In both subjects, needle electromyography of the left superior longitudinal muscle of the tongue showed fibrillation potentials, positive sharp waves and rarefaction of motor units. Computed tomography, including the skull base, brain magnetic resonance imaging and ENT exam were unremarkable. Examination of blood and CSF including rheumatologic parameters, CSF cytology, culture, neurotropic viruses, serology, onconeural and antineuronal antibodies revealed no relevant abnormalities. Both

*Correspondence: Christian.Eggers@kepleruniklinikum.at

Department of Neurology, Kepler University Hospital, Linz, Austria





Fig. 1 49-year-old man with left-sided hypoglossal nerve palsy after second SARS-CoV-2 vaccination. The palsy developed ten days after application of AstraZeneca vaccine and improved in the following weeks without specific treatment

subjects improved significantly over the following weeks without specific treatment.

An extensive literature research on PubMed with the broad search term “hypogloss* AND (paresis OR paralysis OR palsy)” revealed 467 cases with either clinically predominant or completely isolated hypoglossal nerve lesion. Only 68 of these (14%) were classified as idiopathic.

Discussion and conclusions

As we found no other etiologies and due to close temporal relationship, we suspect SARS-CoV-2 vaccination as the cause for hypoglossal nerve palsy in both patients. This is supported by the rarity of isolated hypoglossal nerve palsies of whatever origin, even more so of idiopathic cases. Vaccination-related 12th nerve injury is very rare. In the current literature only one case of a 12th nerve palsy occurring shortly after influenza vaccination in a 7-month-old girl with cystic fibrosis is reported [3]. Autoimmune reactions such as antibodies cross-reacting with peripheral myelin proteins are thought to be an important mechanism for post-vaccination neurological sequelae [4]. A large case–control study found that SARS-CoV-2 vaccination conferred a significantly increased risk for Bell’s palsy, Guillain-Barré syndrome and myasthenic disorders, all of which are linked to autoimmune etiologies [1].

The risk for isolated cranial nerve palsies such as Bell’s palsy and for combined cranial nerve palsies such as Miller Fisher syndrome or Guillain–Barre syndrome is substantially higher after SARS-CoV-2 infection than after receiving SARS-CoV-2 vaccination [1]. There are a few reports of isolated hypoglossal nerve palsies and combined affection including other cranial nerves after COVID-19 [5, 6].

In conclusion, we suggest the possibility of, albeit rare, SARS-CoV-2 vaccination-induced isolated hypoglossal nerve palsy. However, definitive proof of causality requires postvaccination surveillance programs of larger populations.

Abbreviations

SARS-CoV-2: Severe acute respiratory syndrome coronavirus 2; ENT: Ears, nose, throat; CSF: Cerebrospinal fluid.

Acknowledgements

Supported by the Johannes Kepler Open Access Publishing Fund.

Authors’ contributions

JP and CE contributed to designing the case report, data collection and writing the manuscript. LK reviewed the manuscript and validated its content. All authors read and approved the final manuscript.

Funding

All authors confirm that the research didn’t receive any funding.

Availability of data and materials

Data will be provided by contacting Christian Eggers.

Declarations

Ethics approval and consent to participate

A written informed consent from both patients to participate was obtained. A written statement from the Johannes Kepler Universität ethic committee was obtained, declaring that Case Reports need no approval was obtained.

Consent for publication

A written informed consent from both patients to publish the Case Report was obtained.

Competing interests

All authors confirm that there are no conflicts of interest.

Received: 26 April 2022 Accepted: 21 October 2022

Published online: 09 November 2022

References

- Patone M, Handunnetthi L, Saatci D, Pan J, Katikireddi SV, Razvi S. Neurological complications after first dose of COVID-19 vaccines and SARS-CoV-2 infection. *Nat Med*. 2021;27(12):2144–53.
- Georg Heckmann J, Paul Urban P, Pitz S, Guntinas-Lichius O, Gágyor I. The diagnosis and treatment of idiopathic facial paresis (Bell’s Palsy). *Dtsch Arztebl Int*. 2019;116(41):692–702.
- Felix JK, Schwartz RH, Myers GJ. Isolated hypoglossal nerve paralysis following influenza vaccination. *Am J Dis Child*. 1976;130(1):82–3.
- Allen CM, Ramsamy S, Tarr AW, Tighe PJ, Irving WL, Tanasescu R, u. a. Guillain–Barré Syndrome Variant Occurring after SARS-CoV-2 Vaccination. *Annals of Neurology* 2021;90(2):315–8.
- Costa Martins D, Branco Ribeiro S, Jesus Pereira I, Mestre S, Rios J. Unilateral hypoglossal nerve palsy as a COVID-19 Sequel. *Am J Phys Med Rehabil*. 2020;99(12):1096–8.
- Cavalagli A, Peiti G, Conti C, Penati R, Vavassori F, Taveggia G. Cranial nerves impairment in post-acute oropharyngeal dysphagia after COVID-19. *Eur J Phys Rehabil Med*. 2020;56(6):853–7.

Publisher’s Note

Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.