

# Herpes Zoster involving the maxillary branch of the right trigeminal nerve after viral vector COVID-19 vaccine: is it a possible adverse effect?

Rebeh Bougossa<sup>1</sup>, Wafa Marrakchi<sup>2</sup>, Hamza Maatoug<sup>1</sup>, Ikbel Kooli<sup>1</sup>, Hajer Ben Brahim<sup>1</sup>, Abir Aouam<sup>1</sup>, Adnene Toumi<sup>1</sup>, and Mohamed Chakroun<sup>1</sup>

<sup>1</sup>Fattouma Bourguiba University Hospital of Monastir

<sup>2</sup>Affiliation not available

February 22, 2024

## Abstract

Many cases of VZV reactivation after mRNA and inactivated COVID-19 vaccine have been reported in the literature. We report a case of an herpes zoster involving the maxillary nerve in a 66 year-old immunocompetent female, that appeared 5 days after the first dose of a viral vector COVID-19 vaccination, with a favourable outcome.

## Herpes Zoster involving the maxillary branch of the right trigeminal nerve after viral vector COVID-19 vaccine: is it a possible adverse effect?

### Authors and affiliation:

Rebeh Bougossa, Wafa Marrakchi, Hamza Maatoug, Ikbel Kooli, Abir Aouam, Hajer ben Brahim, Adnéne Toumi, Mohammed Chakroun

Department of infectious Diseases, University Hospital Fattouma Bourguiba, Monastir, Tunisia

**Corresponding author:** Rebeh Bougossa

Email: rebeh.gos@gmail.com

Tel: +21621923696

**Keywords:** Herpes zoster, varicella zoster virus, COVID-19, vaccine, maxillary nerve

**Word count:** 1174

**Figure:** 1

### Background:

Herpes Zoster is a reactivation of a latent infection with *Varicella-Zoster Virus* (VZV) in a sensory ganglia, often triggered by age-related immunosenescence and immunocompromised state. Maxillary branch of the trigeminal nerve is rarely affected in this infection and approximately seen in 1.7% of the cases [1]. Among risk factors of herpes zoster, vaccines are not common. Recently, cases of VZV reactivation after COVID-19 vaccine have been reported in the literature [2,3].

Here, we report a case of an herpes zoster involving the maxillary nerve in a 66 year-old immunocompetent female, that appeared 5 days after the first dose of viral vector COVID-19 vaccination.

## Case report:

A 66-year-old female, with a history of arterial hypertension, was admitted to the infectious diseases department for vesicular eruption associated with a severe pain on her right side of the face. She reported that she received her first dose of AstraZeneca COVID-19 vaccine 5 days ago. No other symptoms such as fever, dyspnea or cough were accompanied. The physical examination revealed: a temperature of 37 °C, heart rate 92 beats per minute, respiratory rate 16 breaths per minute, blood pressure 120/70 mmHg and Glasgow coma score of 15. The vesicular lesions contained purulent fluid upon an erythematous base and were localized in the right cheek, side of nose and upper lip, associated with palpebral edema (Figure1). The oral mucosa was intact.

The biological findings of the serum showed: blood cell counts, renal and hepatic functions within normal limits and an elevated c-reactive protein (35 mg/L). The serological tests of Human Immunodeficiency Virus (HIV) 1 and 2 were negative. The patient didn't report the use of immunosuppressive drugs or corticosteroid therapy, a history of malignancy, physical trauma or psychological stress. The diagnosis of herpes zoster in the right maxillary branch of trigeminal nerve with bacterial superinfection was made based on the clinical dermatomal presentation of the lesions. Antiviral treatment was started with acyclovir 750mg thrice daily for 10 days associated with antibiotic treatment: amoxicillin-clavulanic acid 1gr three times a day for a week to treat the bacterial superinfection. The outcome was favourable unless a moderate postherpetic neuralgia.

## Discussion:

*Varicella-zona Virus* reactivation in immunocompetent cases infected with Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-Cov2) has been published [4, 5]. This association can be explained by cytokine release and lymphopenia during the COVID-19 [6]. A fair number of Herpes zoster cases developing after the administration of mRNA and inactivated COVID-19 vaccines have been reported in the literature [2, 3, 7, 8]. The majority of the cases developed after the first dose versus the second dose of the vaccine. However, reported cases of reactivation of VZV after viral vector COVID-19 vaccines were few [9].

Most commonly reported adverse effects of COVID-19 vaccine were short term, mild to moderate pain in injection site, fatigue, fever and headache, but other side effects remain unknown [10]. The short delay of onset after vaccination and the occurrence in immunocompetent patients suggests a strong link between COVID-19 vaccine and herpes zoster emergence. The exact mechanism remain unsolved, but it is possible that the VZV reactivation is one of the side effects of the novel vaccination. A case control study of Alhasawi A *et al* , enrolling 186 patients, showed that the COVID-19 vaccination had significant statistical association with herpes zoster (adjusted matched odds ratio=4.87, 95% confidence interval : 2.40 – 9.89,  $p < 0.001$ ) [11].

These vaccines don't cause lymphopenia or cytokine release, but they can induce an immunomodulation that may be responsible for herpes zoster [12]. Another theory is suggesting similarities with the immune reconstitution syndrome (IRS) which is a paradoxical worsening of a pre-existing infection seen in immunocompromised HIV patients, following the initiation of antiretroviral therapy [13].

The ophthalmic division of the trigeminal nerve is the most involved branch in herpes zoster, while the maxillary nerve, the second division which is affected in our case, is the least frequently affected and rarely causes ocular injury [14]. In the study of Psychogiou *et al* , there were two cases of herpes zoster of the second division of the trigeminal nerve following mRNA COVID-19 vaccine [13].

## Conclusion:

There are increasing case reports about herpes zoster following mRNA COVID-19 vaccines. But few case reports of reactivation of VZV after viral vector COVID-19 vaccines have been reported. To the best of our knowledge, this is the first case of herpes zoster involving the maxillary branch of trigeminal nerve after viral vector COVID-19 vaccine. Although, we are aware that the association could be coincidental and further studies are needed to verify these results.

**Role of the funding source:** This research did not receive any specific grants from funding agencies in

the public, commercial, or not-for-profit sectors.

**Declarations of interest:** None

**Acknowledgments:** None

**Authors' contributions:** All authors treated the patient, drafted the manuscript, critically reviewed the manuscript, and approved its final version.

**Ethical approval:** No ethical approval was required for this publication.

## Bibliography:

- [1] Patil S, Srinivas K, Reddy BS, Gupta M. Prodromal herpes zoster mimicking odontalgia—a diagnostic challenge. *Ethiop J Health Sci.* 2013;23(1):73-7.
- [2] Rodriguez-Jimenez P, Chicharro P, Cabrera L-M, Segui M, Morales-Caballero A, Llamas-Velasco M, et al. Varicella-zoster virus reactivation after SARS-CoV-2 BNT162b2 mRNA vaccination: Report of 5 cases. *JAAD Case Rep.* 2021;12:58-9.
- [3] Chiu H-H, Wei K-C, Chen A, Wang W-H. Herpes zoster following COVID-19 vaccine: a report of three cases. *QJM.* 2021;hcab208.
- [4] Ferreira ACA de F, Romao TT, Macedo YS, Pupe C, Nascimento OJM, Fellow of the American Academy of Neurology (FAAN). COVID-19 and herpes zoster co-infection presenting with trigeminal neuropathy. *Eur J Neurol.* 2020;27(9):1748-50.
- [5] Tartari F, Spadotto A, Zengarini C, Zanoni R, Guglielmo A, Adorno A, et al. Herpes zoster in COVID-19-positive patients. *Int J Dermatol.* 2020;59(8):1028-9.
- [6] Tavakolpour S, Rakhshandehroo T, Wei EX, Rashidian M. Lymphopenia during the COVID-19 infection: What it shows and what can be learned. *Immunol Lett.* 2020;225:31-2.
- [7] Aksu SB, Ozturk GZ. A rare case of shingles after COVID-19 vaccine: is it a possible adverse effect? *Clin Exp Vaccine Res.* 2021;10(2):198-201.
- [8] Bostan E, Yalici-Armagan B. Herpes zoster following inactivated COVID-19 vaccine: A coexistence or coincidence? *J Cosmet Dermatol.* 2021;20(6):1566-7.
- [9] Massip E, Marcant P, Font G, Faiz S, Veron M, Macaire C et al. Zona apres vaccination anti-COVID-19 : serie descriptive de 10 cas. *Ann Dermatol Venereol FMC.* 2021 ;1(8) :A250-A251.
- [10] Polack FP, Thomas SJ, Kitchin N, Absalon J, Gurtman A, Lockhart S, et al. Safety and Efficacy of the BNT162b2 mRNA Covid-19 Vaccine. *New England Journal of Medicine.* 2020;383(27):2603-15.
- [11] Alhasawi A, Kamel M, Elmasry S, Kamel W, Hassan A. Impact of COVID-19 Vaccination on Varicella Zoster Virus Reactivation: A Case Control Study. 2021;1-6.
- [12] Walter R, Hartmann K, Fleisch F, Reinhart WH, Kuhn M. Reactivation of herpesvirus infections after vaccinations? *Lancet.* 1999;353(9155):810.
- [13] Psychogiou M, Samarkos M, Mikos N, Hatzakis A. Reactivation of Varicella Zoster Virus after Vaccination for SARS-CoV-2. *Vaccines (Basel).* 2021;9(6):572.
- [14] Patro S, Jena P, Misra G, Rath K, Khatua P. Herpes zoster infection involving the maxillary branch of the right trigeminal nerve - a rare case report. *The Antiseptic.* 2013;110:36-8.

