

Case Report: Successful Post-COVID Severe Peripheral Polyneuropathy Treatment Post AZD1222 ChAdOx1 SARS-CoV-2 Vaccination

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How to cite this paper: Porto de Melo, P.M. and Costa, R.A.P. (2022) Case Report: Successful Post-COVID Severe Peripheral Polyneuropathy Treatment Post AZD1222 ChAdOx1 SARS-CoV-2 Vaccination. *Case Reports in Clinical Medicine*, 11, 146-151. <https://doi.org/10.4236/crcm.2022.115022>

Received: April 2, 2022

Accepted: May 10, 2022

Published: May 13, 2022

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Abstract

Background: The condition known as polyneuropathy causes peripheral nerve disability, and is characterized by symmetrical distal numbness and paresthesia, often accompanied by pain and weakness. With the advancement of the pandemic in Brazil and in the world, the need for therapies as well as prophylaxis became the main focus in disease control as the viral vector platform vaccine AstraZeneca. Some effects were observed over the period of application. **Case Summary:** A male patient, 63 years old, previously vaccinated for COVID-19, developed active infection by the virus and in his convalescent period presented intense weakness, with prejudice to his daily activities, including personal hygiene ones. **Conclusion:** The patient made a complete recovery after combination therapy with testosterone derivatives, ivermectin, corticosteroids, and vitamins, besides rehabilitation.

Keywords

COVID-19, Vaccines, Case Report, Corticosteroids, Testosterone, Ivermectin

1. Introduction

Peripheral polyneuropathy is a generalized disorder of the peripheral nervous system and occurs when severe damage occurs to several peripheral nerves, which carry information from the brain and spinal cord to the rest of the body, causing symptoms such as weakness, tingling, and persistent pain. Although this disease most often affects the feet and hands, it can affect the whole body and usually happens as a complication of diabetes, exposure to toxic substances or infections, for example. They present a prevalence of approximately 5% - 8%,

and thus they represent the commonest disorder in this disease group. In most cases, symptoms improve with treatment of the condition causing the nerve damage, but in other situations, it may be necessary to maintain constant use of medication to control symptoms and improve quality of life [1] [2] [3].

With the emergence of the coronavirus disease and the establishment of the pandemic state around the world, possible treatments for the disease began to emerge, among them, treatments with ivermectin, vitamins, and corticosteroids. Some RCTs compared ivermectin and azithromycin with hydroxychloroquine/azithromycin in patients with different degrees of severity of COVID-19, ivermectin/doxycycline with hydroxychloroquine/azithromycin in mild to moderate COVID-19; ivermectin (in different regimens and doses) and hydroxychloroquine with hydroxychloroquine or hydroxychloroquine and placebo in patients with different degrees of severity and Ivermectin/doxycycline/standard care (azithromycin, zinc, vitamin D, vitamin C and acetaminophen, corticosteroids and oxygen as needed) in standard care patients (azithromycin, zinc, vitamin D, vitamin C and acetaminophen, corticosteroids and oxygen as needed) in patients with varying degrees of severity (excluding critically ill patients, who were allocated only to the intervention group, for ethical reasons. All treatments showed significant improvement in patients, both when presented in clinical trials with adequate designs and in the clinical practice of thousands of physicians around the world [4] [5] [6].

As well as the possible treatments, there was also a great advance in the forms of prophylaxis against the disease, among them, the most important, vaccines. They have impacted COVID-19-related morbidity and mortality rates worldwide. Data from studies of approved vaccines for COVID-19 showed their benefits across different age groups [7] [8] [9]. However, recent reports have raised concerns about some vaccines' adverse effects like myocarditis, for example, especially among the young male population related to different types of COVID-19 vaccines. The AstraZeneca vaccine is a non-replicating viral vector vaccine, when the formula enters the cells, it carries part of the RNA of SARS-CoV-2. By interacting with this genetic material, the human cell itself will produce virus proteins—in this case, the spike protein, which is on the surface of the virus and is used to invade the cells—and release them into the organism. The immune system recognizes this protein as an invader and prepares defenses against it. If the individual has contact with the real virus, the organism will already know how to recognize and neutralize the spike protein, preventing infection.

The present work aims to present the case report of a 63-year-old patient in the city of Sao Paulo, Brazil, in the second semester of 2021, who developed severe peripheral polyneuropathy after vaccination with AstraZeneca and the successful treatment that made him recover from the condition. This case report is particularly important because there are already several reports in the literature about the correlation of neurological events, the most common being headache, Guillain-Barre syndrome (GBS), venous sinus thrombosis (VST), transverse myelitis, and COVID-19 vaccines [10]. The molecular mechanisms that could

explain this correlation still need to be deeply investigated.

2. Case

A 63-year-old male patient, military, athletically active, with weekly running and swimming activities, no prior diseases or medicine use, was previously fully vaccinated with the AZD1222 (ChAdOx1) vaccine, developed 36 days after his second shot and active infection by COVID-19, characterized by fever, tremor, cough and two transient episodes of global weakness and tingling. On his fifth disease day, the patient was submitted to a chest scan, which revealed less than 10% viral pneumonia compromise of both lungs. The patient was followed by his doctor and relieved on his 15th disease day. One month later, the patient developed progressive stiffness of the joints of his upper limbs, with weakness of his muscles, especially of his lower limbs and deltoids and biceps. There was, also, a tingling sensation on his arms and legs, and eventually on his tongue. The patient then was referred to a neurologist. His neurological examination showed asymmetric tetraparesis, with a marked predominance of deltoid and biceps on his upper limbs, and global on his lower limbs. There was prejudice to daily activities such as brushing his teeth and even walking by himself. The gait was done only with help of a chair, used by the patient as a support to allow him to help maintain his posture and try to walk short distances, step by step. There was also the abolition of profound reflexes and slight atrophy of the described musculature. Laboratory exams showed slight elevation of d-dimer and lower testosterone, DHEA and androstenedione levels (about half the previous levels of the patient's prior exams), slight C reactive protein elevation and COVID-19 IgG 50 fold the superior reference level. Thrombophilia tests were all negative. Neutralizing antibodies were 97%.

The patient's symptoms were interpreted as long COVID-19 probably potentialized by previous vaccination, and the author introduced ivermectin (6 mg for each 30 kg of weight), colchicine (0.5 mg twice a day), oxandrolone (30 mg once a day) and DHEA (50 mg once a day).

Over the next few days, the patient's condition improved dramatically. After 48 hours, the patient noticed that the tingling resumed. One week later, there was the sensation of a certain degree of his weakness, allowing him to move to a sitting position unassisted. After three weeks, the patient was able to walk without help or support and one month later he returned to running short distances and resistance training at the gym. New blood samples showed normalization of previously altered indexes.

3. Discussion

In face of the coronavirus disease, therapeutic and prophylaxis alternatives have emerged, in particular the vaccines. Several platforms were presented, including the non-replicating viral vector presented by Astra Zeneca. During the course of vaccine application, some adverse events were observed, many of them

non-reported. Myocarditis in particular was seen in a young male population.

Here, we report the case of a patient who, after a few days of taking the AstraZeneca vaccine, started to present severe peripheral polyneuropathy. Peripheral polyneuropathy is a condition that can occur as a result of several events, among which it can be triggered by toxic substances or infections. The case seems to be closely related to the vaccine as the vaccine is made from the spike protein portion of the virus, the really infectious and toxic one.

In fact, we have seen described in the literature the same condition being caused by the chikungunya virus infection. In the case reported, the virus was identified in a serum sample from an elderly female patient with febrile illness and severe arthralgia in Brazil. Evidence of polyneuropathy affecting upper and lower limbs was obtained from electroneuromyographic findings. The patient was treated with corticoids and methotrexate suggesting that the pathophysiological basis of the case in question could be related to the immune-mediated response by T cells and inflammatory cytokines [11].

There are several reports in the literature that indicate a possible correlation between COVID-19 vaccines and neuropathological events. In the Finsterer, 2021 review [10], the author describes the major neuropathological events as being Guillain-Barre syndrome (GBS), venous sinus thrombosis (VST), and transverse myelitis and that they occur on average 4 weeks after vaccine application. The intracellular mechanisms that may explain this relationship still need to be investigated.

In the case of the patient in question, the treatment was performed with corticosteroids, ivermectin, testosterone derivatives and vitamins, besides rehabilitation (Figure 1). All drugs used in the treatment of the patient proved to be extremely effective in the fight against SARS-CoV-2 throughout the pandemic period. Ivermectin, for example, is a well-known drug that is approved as an antiparasitic by the World Health Organization and the US Food and Drug Administration [12] [13]. It is widely used to treat worm infections and at usual doses (0.2 - 0.4 mg/kg) is considered extremely safe for use in humans [14] [15]. In addition to its antiparasitic activity, ivermectin also has antiviral and anti-inflammatory properties, leading to a list of an increasing number of therapeutic indications.

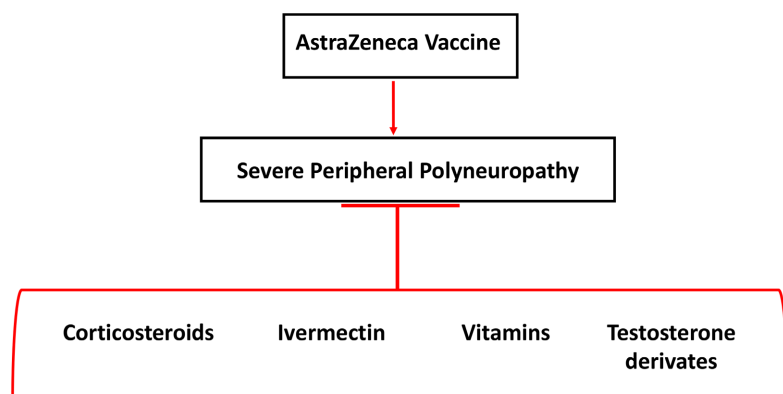


Figure 1. Severe peripheral polyneuropathy post COVID-19 vaccine treatment.

4. Conclusion

The patient's treatment proved to be extremely effective, leading to a complete recovery in a few days, which can be attested by the patient's own perspective: *In three weeks after my fall, I started to run my 100 m. I went back to weight training. My doctor's intervention was really spectacular because I really didn't even have the strength to lift my hand or move myself from the bed and after three weeks, I'm back to the weight training gyms and swimming activities, so thank you very much, my dedicated doctor, for your successful intervention.*

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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