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REVERSIBLE RADICULOMYELITIS AFTER ChAdOx1 nCov-19 VACCINATION

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Complete List of Authors:	Spataro, Rossella; ALS Clinical Research Center, University of Palermo, Department of Biomedicine, Neuroscience and Advanced Diagnostics Fisco, Giacomo; IRCCS Centro Neurolesi Bonino Pulejo La Bella, Vincenzo; University of Palermo, Department of Biomedicine, Neurosciences and Advanced Diagnostic
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TITLE OF CASE

REVERSIBLE RADICULOMYELITIS AFTER ChAdOx1 nCov-19 VACCINATION

SUMMARY

There is a growing concern about adverse events occurring after SARS-COV-2 vaccination. We present the case of a young woman with fully reversible radiculomyelitis, which happened after the first dose of the ChAdOx1 nCovid-19 vaccine.

A previously healthy 21-years-old woman presented with a subacute onset of legs weakness and sensory disturbances, urinary dysfunction and cramping pain after receiving the first dose of the ChAdOx1 nCoV19 vaccine. An extensive diagnostic workup led to the diagnosis of inflammatory radiculomyelitis. Her clinical status improved, and after a few months, she had a complete recovery.

The case described is a reversible radiculomyelitis associated with the ChAdOx1 nCovid-19 vaccine. The clinical picture and evolution supported the diagnosis. No other identifiable causes of myelopathy were found.

Our patient showed clinically moderate symptoms and signs, and she showed good recovery. The post-vaccine inflammatory radiculomyelitis is a rare side effect of the anti-COVID-19 vaccination, and it should not discourage from the SARS-COV-2 vaccination program.

BACKGROUND

The outbreak of the COVID-19 pandemic had caused devastating effects on the health, economic and social systems worldwide. The recent introduction of vaccinations has been a milestone, reversing the infection curve and counteracting the pandemic.

The European Medicines Agency authorized four vaccines against Covid-19. One of these, i.e., the ChAdOx1 nCovid-19 vaccine (AstraZeneca), has raised concerns on safety due to the occurrence of severe, though rare, side effects, as cerebral venous thrombosis. The safety analysis of data from four randomized trials has reported significant side effects in 79 out of 12021 (i.e., 0,6%) subjects receiving at least one dose of the ChAdOx1 nCovid-19 vaccine [1,2]. A single case of acute myelitis, occurring 14 days after booster vaccination, was described as a side effect of the vaccine [3]. However, the clinical characteristics and, mostly, the outcomes of this single case were not reported.

Here, we describe the case of a young woman with subacute onset radiculomyelitis after receiving the COVID-19 ChAdOx1 nCoV19 vaccine, with a complete resolution.

CASE PRESENTATION

A previously healthy 21-years-old sailor woman complained about a subacute onset of legs weakness and cramping pain three days after receiving the first dose of the ChAdOx1 nCoV19 vaccine. These symptoms in the following days showed an apparent subjective improvement, and the patient did not seek medical advice. However, ten to twelve days after presentation, the weakness in the lower limbs worsened, associated with mild urinary retention, increasing paresthesia, and sensory disturbances.

The legs' weakness became so severe that she could not walk. She was immediately referred to the Emergency Unit of our Hospital. At the examination, she was afebrile and with normal vital signs.

The neurological examination showed in both lower limb a 2/3 MRC muscle strength proximally (iliopsoas, quadriceps) and distally (ankle dorsiflexion and plantar flexion), mild spasticity, very brisk patellar, abductor and Achilles tendon reflexes with horizontal and vertical extension, legs paresthesia. Tactile and pinprick sensation was decreased from T4 dermatome downward. Passive and active legs movements elicited rigidity and tenderness. Babinski sign was equivocal bilaterally. As she had mild retention, a urinary catheter was inserted. All other aspects of the neurological examination, particularly the upper limbs and bulbar region, were normal.

INVESTIGATIONS *If relevant*

An extensive biochemical workup, including blood cell counts, electrolytes, kidney and liver parameters, and urine analysis, gave negative results. Serum antibodies to SARS-COV-2 were within the normal range. Autoimmune screening (i.e., anti-nuclear, anti-extractable nuclear antigen, antiDNA, anti-gliadin, anti-transglutaminase, anti-endomysial, anti-thyroid peroxidase and anti-thyroglobulin antibodies) was negative. Cerebrospinal fluid (CSF) analysis showed increased proteins, average glucose and 2 cell/ μ l (primarily lymphocytes). Oligoclonal bands were detected in both serum and CSF with a pattern IV. PCR real-time analysis for HSV1, HSV2, VZV, EBV, CMV, HHV6, HHV8, Mycobacterium tuberculosis and Enterovirus in CSF was negative. Main laboratory data are shown in Table 1

Brain and spinal cord MRI showed no parenchymal hyperintensities, and gadolinium administration did not show enhancement. EMG/ENG of the upper and lower limbs and motor/sensory Evoked Potentials were negative.

A diagnosis of post-vaccine inflammatory radiculomyelitis with no imaging changes, very likely linked to the former anti-COVID-19 vaccination, was made [3,4].

Table. I. Laboratory Data

Variable	Reference Range, Adults	On Admission
Glucose (mg/dl)	70-100	82
Creatinine (mg/dl)	0.5-0.95	0.61
Urea nitrogen (mg/dl)	10-50	24
Albumin (g/dl)	3.5-5.2	4.2
Alanine Aminotransferase (U/L)	0-31	21
Aspartate aminotransferase (U/L)	0-31	12
Alkaline phosphatase (U/L)	35-104	64
Total Bilirubin (mg/dl)	0-1.2	1.19
Direct Bilirubin (mg/dl)	0-0.30	0.4
Sodium (mmol/L)	136-145	139
Potassium (mmol/L)	3.3-5.1	4.18
Chloride (mmol/L)	93-108	100

C-reactive protein (mg/L)	0-5	6.3
Creatine kinase /U/L)	26-192	54
Lactate Dehydrogenase (U/L)	50-250	211
Hematocrit (%)	35-48	40
Hemoglobin (g/dl)	12-16	12
Red-cell count (106/μl)	3.8-5.0	4.05
White-cell count (per μl)	4000-11,000	7780
<i>Differential count (per μl)</i>		
Neutrophils	2000-8000	4620
Lymphocytes	1000-5000	2230
Monocytes	160-1000	690
Eosinophils	20-800	200
Immature granulocytes	0-100	40
Platelets count (103/μl)	150-450	304
D-dimer (ng/ml)	<500	486
Erythrocyte Sedimentation Rate (mm/hr)	0-13	28
Prothrombin time (seconds)	24-36	31
Prothrombin-time International		
Normalized Ratio (INR)	0.9-1.1	1.05
CSF Analysis		
Color	colorless	colorless
Turbidity	clear	clear
Glucose (mg/dl)	40-70	59
Red-cell count (per μl)	0-5	1
Nucleated-cell count (per μl)	0-5	7
<i>Differential count (%)</i>		
Neutrophils	0	0
Lymphocytes	0-100	90

TREATMENT *If relevant*

The patient was treated with a course of intravenous high-dose methylprednisolone for five days, followed by intramuscular betamethasone injection for additional fifteen days with a noticeable improvement. The urinary catheter was removed, and she was discharged at home, able to walk with a double cane.

OUTCOME AND FOLLOW-UP

At the first follow-up four weeks later, she reported a further clinical improvement. The neurological examination showed a mild spastic paraparesis with an uncertain but autonomous gait. Sensory abnormalities and muscle tenderness had disappeared. A novel post-contrast spinal MRI was normal.

At two months follow-up, a nearly complete recovery was observed, and she could walk almost normally.

DISCUSSION *Include a very brief review of similar published cases*

We have described a case with an inflammatory radiculomyelitis after the ChAdOx1 nCovid-19 vaccination [4]. Several lines of evidence supported the diagnosis: the patient presented with a subacute onset of leg weakness with brisk reflexes, mild urinary dysfunction and a medullary level of sensory disturbances. Distal nerve conduction studies were negative.

Although MRI studies of the spine showed no signal change, neither in basal conditions nor after gadolinium, the patient significantly improved after IV methylprednisolone. This result is not surprising as up to 40% of the acute inflammatory myelopathies do not show post-contrast MRI enhancement [5].

The extensive anti-Covid-19 vaccination campaign has raised concerns about the possible neurological consequences of vaccines. While post-COVID-19 infection acute myelitis has been described [6-8], the pathological condition after a SARS-COV-2 vaccine is rare. A recent review summarized four randomized clinical trials in which only two cases of SARS-COV-2 vaccine-related myelitis were reported. One turned out to be a previously unrecognized multiple sclerosis [3].

According to a recent review [9], the occurrence of post-vaccine acute myelitis (any type) is anyway exceedingly rare, accounting for only 37 cases spanning 39 years and showing a temporal association from a few days up to three months.

The specific pathogenic pathway leading to post-COVID-19-vaccination acute inflammatory radiculomyelitis is unclear, but immune mechanisms are very likely, possibly through molecular mimicry [9]. It remains a very infrequent complication of a ChAdOx1 nCovid-19 vaccination. Our case was relatively mild, with an excellent middle-term prognosis and complete recovery.

LEARNING POINTS/TAKE HOME MESSAGES 3-5 bullet points

- Neurological complications have been described after COV-19 infection
- There is a growing concern about possible neurological consequences of the SARS-COV-2 vaccination
- Inflammatory radiculomyelopathy post-SARS-COV-2 vaccination is rare. The case presented showed that the diagnosis is mainly based on history, neurological signs and CSF analysis. The imaging studies can be negative.
- Outcome can be favourable, and improvement is fostered by IV high-dose methylprednisolone

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