Tozinameran

S

Immune-mediated necrotising myopathy: case report

A 55-year-old woman developed immune-mediated necrotising myopathy following administration of tozinameran COVID-19 vaccine.

The woman developed myalgia, fatigue, chills and vague generalised weakness on the day following receipt of her first dose of tozinameran injection [BNT162b2 vaccine; *dosage and route not stated*]. On day 21, after she received her second dose of tozinameran, her symptoms worsened to progressive weakness. On day 49, she presented to an emergency department, unable to walk. Her serum creatine kinase (CK) level was 7967 IU/L.

The woman was treated for rhabdomyolysis with IV fluids and discharged. However, on day 56, she returned with persistent symptoms. Neurological examination showed normal cranial nerve functions. There was symmetrical weakness of the proximal upper and lower extremity muscles, which graded 2 to 3/5 on the Medical Research Council (MRC) scale, with preserved strength in the distal muscles and normal sensation. Sensory and motor nerve conduction studies in the upper and lower extremities were normal bilaterally. Needle electromyography revealed positive sharp waves, fibrillation potentials and small amplitude motor unit potentials with early recruitment in the right deltoid, triceps, vastus lateralis, tibialis anterior and gastrocnemius muscles. MRI on day 60 demonstrated increased signal intensity on short-tau inversion recovery images of the thigh muscles, suggestive of myositis. On day 47, the antinuclear antibody test by indirect immunofluorescence antibody was positive with a cytoplasmic (reticular) pattern, suggestive of antibodies to cytoplasmic targets. Anti-SRP autoantibodies were identified. SARS-CoV-2 tests by RT-PCR assay of nasopharyngeal swabs were negative on days 58, 67, and 208. She was treated with IV immune globulin [immunoglobulin] 1 g/kg every 4 weeks, high-dose prednisone 30mg twice daily, and methotrexate 12.5–25 mg/week. She received six doses of immune globulin. On day 98, serum was tested for SARS-CoV-2 antibodies using a Food and Drug Administration early-use-authorised xMAP assay detecting immunoglobulin G (IgG) antibodies to nucleocapsid, S1, and RBD of S1, measured as median fluorescence intensity (MFI). The seronegative reference range for all three analytes was 0 to 700 MFI. She had high-titre anti–S1-RBD IgG antibody (MFI = 2604) but normal-range antibodies to nucleocapsid (MFI = 109) and S1 (MFI = 294), consistent with a response to the mRNA vaccination. On day 64, a muscle biopsy of the left vastus lateralis showed myopathic changes, including necrotic myofibers; regenerating myofibers, scattered to focally aggregated CD68+ macrophages with rare CD4+ or CD8+ T cells; and focal major histocompatibility complex-1 expression, consistent with immune-mediated necrotising myopathy secondary to tozinameran. Electron microscopy demonstrated ultrastructural changes, including previously described mitochondrial abnormalities in immune-mediated necrotising myopathy. Despite treatment with immune globulin, prednisone and methotrexate, a follow-up (6-9 month) assessment demonstrated residual weakness graded 3 to 4/5 on the MRC scale bilaterally in the proximal muscles of the upper and lower extremities with persistently elevated creatine kinase levels.

Dodig D, et al. Immune-mediated necrotizing myopathy after BNT162b2 vaccination in a patient with antibodies against receptor-binding domain of SARS-CoV-2 and signal recognition particle. Muscle and Nerve 65: E11-E13, No. 4, Apr 2022. Available from: URL: http://onlinelibrary.wiley.com/journal/10.1002/(ISSN)1097-4598 803660534