Pembrolizumab-induced fulminant myositis and cardiotoxicity in metastatic thymoma

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Introduction: Pembrolizumab is an immune checkpoint inhibitor that targets programmed cell death-1 receptors, and its common adverse effects include dermatitis, colitis, pneumonitis, and thyroiditis. Severe side effects such as myositis and cardiotoxicity are rare but significant because they can be fatal. Here we report a case of pembrolizumab-induced fulminant myositis with cardiotoxicity after one treatment cycle in a patient with metastatic thymoma.

Case: A 48-year-old Korean woman with recurrent thymoma visited a clinic with motor weakness of four limbs after the first cycle of pembrolizumab as 3rd line treatment. Laboratory findings showed a dramatic increase in muscle and cardiac enzyme levels. Figures A and B show the changes in levels of muscle and cardiac enzymes, respectively, as the treatment progressed. A nerve conduction study and electromyography showed myopathy in the proximal muscles of the upper and lower limbs but no peripheral neuropathy. She was administered intravenous methylprednisolone 2mg/kg/day immediately after admission. Although the muscle enzyme levels consistently improved, her muscle weakness worsened despite 11 days of treatment with steroid. Mycophenolate mofetil was added as an immunosuppressive agent on the 12th day, but there was no effect. On the 18th day, immunoglobulin G(IVIgG) was administered intravenously. Respiratory failure progressed, and mechanical ventilation was applied. After 5 days of IVIgG therapy, the muscle enzyme levels recovered to the normal range. Her motor strength gradually improved, and she was extubated on the 25th day. However, the weakness and hypercapnia worsened again after the extubation. Therefore, plasma exchange therapy was performed on the 30th day. After the therapy, her motor strength recovered, and she no longer complained of dyspnea.

Discussion: Close monitoring for the early diagnosis of immune related adverse effects is crucial to prevent progression to fatal complications. The rapid initiation of treatment is important. When systemic steroids seem ineffective, IVIgG administration and plasma exchange therapy must be considered.