A case of polymyositis associated with hepatitis B infection

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ABSTRACT
This report describes the case of a 47-year-old man who developed myositis in association with hepatitis B surface antigen-positive hepatitis. Interestingly, the myositis repeatedly worsened 2 months after the exacerbation of hepatitis in this case, suggesting a close association between hepatitis B infection and myositis. The dose of prednisolone was increased twice in order to treat the exacerbating myositis, resulting in improvement of the muscle symptoms, but the patient eventually died of liver failure. Only 5 other myositis patients with hepatitis B antigenemia have been reported in the literature. We review these cases of the association between hepatitis B infection and myositis.

Introduction
Polymyositis (PM) is an inflammatory muscle disease characterized clinically by proximal muscle weakness and histologically by chronic inflammation of the affected muscles. The etiology of this disorder is unknown, but a variety of causes have been implicated. Among them, some infectious agents have been reported to be associated with myositis. We now describe the case of a 47-year-old man who developed myositis in association with hepatitis B surface antigen (HBsAg)-positive hepatitis.

Case report
A 43-year-old man was found to have an elevated serum aminotransferase level and to have developed HBsAg-positive hepatitis in September 1987 (obscurity in detail). In September 1991, he was hospitalized for one month at another institution with a complaint of severe myalgia. Corticosteroid therapy was initiated with prednisolone 15 mg daily, which was followed by the gradual disappearance of the myalgia (Fig. 1).

In February 1992 the patient was referred to Keio University Hospital (KUH) due to an elevation of his serum aminotransferases (aspartate aminotransferase (AST) 172 IU/L (14-32) and alanine aminotransferase (ALT) 333 IU/L (8-41)). There was no past history of blood transfusions, smoking, or abuse of alcohol. The diagnosis of chronic HBsAg-positive hepatitis was confirmed based on the clinical course and serological examinations (HBsAg (+) and HBs antibody (-) by enzyme immunoassay; hepatitis C virus antibody (HCVCab) (-) by the passive hemagglutination assay).

The patient then developed myalgia and weakness of the larger muscles, includ-
ing the deltoid, biceps, quadriceps and hamstrings. In March 1992 he was admitted to our hospital because his muscle symptoms had become severe and his creatine kinase (CK) level was 6,447 IU/L (67-210) (1st admission, 47 years old). On examination, the patient’s vital signs were normal. There was no detectable thyroidmegaly or lymphadenopathy. Chest and cardiovascular examination revealed no remarkable findings. Abdominal examination revealed that the liver was not tender, but extended 2 cm below the right costal margin. Musculoskeletal evaluation showed weakness in the proximal muscle groups on resistive testing. Palmar erythema was noted, but he did not have any arthritis. Raynaud’s phenomenon, Heliotrope rash, or Gottron sign.

Results of complete blood cell counts were normal, and the Westergreen erythrocyte sedimentation rate (ESR) was 35 mm/hr. AST (416 IU/L) and ALT (132 IU/L) were elevated. Total bilirubin (TB) and alkaline phosphatase (ALP) were normal, but total protein (TP, 6.2 g/dl) and serum albumin (ALB, 2.4 g/dl) were low. CK was increased at 7,221 IU/L (MM 100%). Rheumatoid factor was positive (1:80), but fluorescent antinuclear antibody (FANA) was negative. C3 and CH50 were normal. C4 was 18 mg/dl (20-35). Prednisolone was restarted at 15 mg daily. A left biceps muscle biopsy was done on April 7th. A diagnosis of PM was then made on the basis of an electromyogram (EMG) (myopathic change) was elevated (76 micro mol/l; normal < 50). Abdominal ultrasonography showed some parenchymal changes in the liver suggestive of liver cirrhosis. HBV DNA polymerase was high (2,938 cpm). Despite high-dose corticosteroid therapy (prednisolone 80 mg daily) and interferon-beta therapy (3 x 10^6 unit daily), the patient died in August due to liver failure.

### Discussion

Polymyositis is an inflammatory muscle disease that may be closely related to immune-mediated processes triggered by exposure to environmental factors in genetically susceptible individuals. The triggering event of myositis is unknown, but infectious agents including bacteria, viruses, and parasites have been implicated (1-2). Among these agents, a variety of viral infections associated with myositis have been reported. Influenza virus, echovirus, and adenovirus have been cultured in some patients with myositis (3-5). Electron microscopy analysis has also identified entero virus (coxsakievirus) in some patients with PM (6). Retroviruses, including HIV and human T-cell leukemia-lym phoma virus type I, have been associated with the inflammatory myopathies on the basis of clinical and histopathologic findings (7). Various mechanisms have been proposed for virus-induced myositis, such as direct injury to muscle, alteration of muscle function from nearby infection, and an autoimmune response to viral antigens bound to intracellular enzymes (8-10). The present patient clearly had viral hepatitis, as evidenced by the presence of liver dysfunction with HBs antigen and by liver biopsy. In acute viral hepatitis, some patients develop myalgia and arthralgia, but muscle weakness rarely occurs. The coexistence of polymyositis was confirmed by proximal muscle weakness, elevated muscle enzymes, EMG, and muscle biopsy.

Five myositis patients with hepatitis B antigenemia have been described in the literature, and we summarize the clinical features of these patients as well as the present case in Table I. Four of 6 cases were characterised by the simultaneous occurrence of hepatitis and PM, while 2 cases had chronic hepatitis B virus infection for years prior to the emergence of myositis. It should be.
noted that all of the patients had myalgia that could have been part of a flu-like prodrome to hepatitis B, and none of them had interstitial lung disease. With respect to the autoantibodies, antinuclear antibody, anti-DNA antibody, and rheumatoid factor were found in 3 cases (nos. 2, 3, and 6). Corticosteroid therapy was performed and was effective against myositis in all cases. However, case 2 died of aspiration pneumonia and case 6 died of liver failure (11-15).

In the previous reports, the clinical course of the patients was not described in detail. Interestingly, myositis concurrently worsened 3 months after the exacerbation of hepatitis in our case, suggesting a close association between hepatitis B infection and myositis. However, it will be necessary to elucidate the existence of hepatitis B virus in muscle specimens using immunochrometry, in situ hybridization, or the polymerase chain reaction assay.

References

Table I. Reports in the literature of polymyositis/dermatomyositis and hepatitis B.

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PM/DM: Polymyositis/dermatomyositis; ANA: antinuclear antibody; a-DNA Ab: anti-dsDNA antibody; RF: rheumatoid factor; PSL: prednisolone.

# presence or absence of myopathic change.