



## Case report

# Effect of intravenous immunoglobulin therapy on anti-NT5C1A antibody-positive inclusion body myositis after successful treatment of hepatitis C: A case report

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## ABSTRACT

Inclusion body myositis (IBM) is the commonest idiopathic inflammatory myopathy of older persons. Pathophysiological mechanism of IBM remains unknown; however, an association of IBM with chronic hepatitis C virus (HCV) infection and serum autoantibodies against skeletal muscle protein 5'-nucleotidase 1A (NT5C1A) has recently been reported. No effective treatment for IBM has yet been developed. We here present a 70-year-old man who was anti-NT5C1A antibody-positive in association with IBM and chronic hepatitis C. The initial treatment of ombitasvir/paritaprevir/ritonavir for his chronic hepatitis C was successful; however, his symptoms of IBM did not improve. On the contrary, his quadriplegic paralysis became more severe and he developed dysphagia. Next, steroid pulse therapy was initiated for IBM and, although his hyper-creatinemia improved, his symptoms did not; indeed, they worsened. Subsequent intravenous immunoglobulin therapy (IVIg) resulted in obvious improvement in his dysphagia. Thereafter IVIg therapy was repeated at approximately 2-monthly intervals. His dysphagia remained improved for more than 1 year; however, his quadriplegia continued to progress slowly. Although IBM can reportedly be associated with hepatitis C, we inferred that there was no direct relationship between these conditions in our patient because his IBM did not improve after treatment of his hepatitis C. Although his IBM-associated quadriplegia did not improve, IVIg therapy did result in improvement in his dysphagia.

## 1. Introduction

Inclusion body myositis (IBM), the most common idiopathic inflammatory myopathy of older persons, is characterized clinically by asymmetric finger flexor and knee extensor weakness and histologically by lymphocytic endomysial inflammation and autophagic rimmed vacuoles [1]. The pathophysiological mechanism of sporadic IBM remains unknown; however, an association between IBM and chronic hepatitis C virus (HCV) infection was recently reported [2,3]. Furthermore, serum autoantibodies against skeletal muscle protein 5'-nucleotidase 1A (NT5C1A) is reportedly a relatively specific diagnostic marker for IBM [4,5].

## 2. Case report

A 70-year-old man had difficulty climbing stairs because of weakness of both lower limbs and did not improve despite undergoing rehabilitation. These symptoms slowly worsened over a 1-year period, during which he had difficulty walking and the grip strength of both hands weakened, prompting admission to our hospital. He presented with predominantly left-sided proximal leg, particularly quadriceps muscle, weakness, finger flexor muscle weakness, and atrophy. Serum creatine phosphokinase (CPK) concentration was slightly increased (650 IU/L). The histopathological findings on a biopsy of the rectus femoris muscle performed two months after first visit to our hospital were consistent with IBM in that he had marked endomysial fibrosis with lymphocyte infiltration partially surrounding non-necrotic muscle

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fibers and muscle fibers with rimmed vacuoles. Furthermore, anti-NT5C1A antibodies were detected in the patient's serum by cell-based assay [5], and he had mild liver dysfunction caused by chronic hepatitis C (virus genotype 1b, serum HCV RNA concentration 5.9 logIU/mL). He was initially treated with ombitasvir/paritaprevir/ritonavir for hepatitis C for 3 months, which resulted in improvement in his liver function and negative conversion of HCV-RNA. However, his hyper-CPKemia persisted, accompanied by progression of limb muscle weakness and he began to develop dysphagia. In order to confirm the response to steroid hormones, steroid pulse therapy (methylprednisolone 500 mg/day for 3 consecutive days) was administered about 2 months after HCV treatment because an autoimmune mechanism was suspected due to anti-NT5C1A antibody positivity, in addition to the histopathological findings of myositis with no significant clinical improvement other than an improvement in his hyper-CPKemia. Subsequent intravenous immunoglobulin (IVIg) (400 mg/kg/day for 5 consecutive days) was administered 1.5 months after steroid administration, which improved his dysphagia (Video 1, 2). Thereafter, IVIg treatment was continued at 2-month intervals. His dysphagia remained improved over a year; however, his quadriplegic paralysis continued to become more severe, resulting in difficulty standing and walking.

### 3. Discussion

There are currently no effective treatments for IBM. Adrenocortical hormone preparations are often administered as for polymyositis/dermatomyositis; however, many patients are refractory to this treatment, evidencing slowly progressive muscle weakness even though serum CPK concentrations decline [1]. A relationship between IBM and HCV infection has been reported [2,3], necessitating monitoring for HCV reactivation associated with treatment with steroid hormones or immunosuppressants; however, there are no reports of IBM improving with treatment of HCV. Consistent with this, our patient's symptoms did not improve after successful treatment of HCV. Even after resolution of hepatitis, hyper-CPKemia continued and his limb strength was also reduced. Thus, although HCV may be associated with the onset of IBM, it is not considered to be directly associated with the progression of the pathological condition.

It has been proposed that seropositivity for NT5C1A antibody is associated with severity of dysphagia [6]. A double-blind comparative study has not yielded a significant difference between IVIg therapy and placebo to date [1]. However, IVIg therapy is reportedly effective for

dysphagia and thus may be worth trying, especially when the dysphagia is relatively mild [7]. Our patient's symptoms did not improve with administration of steroid hormones; his quadriplegic paralysis progressed, as did his dysphagia. Subsequent IVIg therapy was associated with obvious improvement in his dysphagia. Thereafter IVIg therapy at 2-month intervals stabilized his swallowing for more than 1 year; however, his quadriplegia and muscle atrophy progressed. Although no effective treatment has yet been developed for quadriplegia associated with IBM, it is worth trying IVIg therapy for IBM-associated dysphagia.

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