

The Treatment for Anti-insulin Antibody-mediated Immunological Insulin Resistance

Hidekatsu Yanai^{a, b, c}, Hiroki Adachi^a, Hidetaka Hamasaki^a, Shuichi Mishima^a

Letter to the Editor:

Anti-insulin antibody is sometimes observed in diabetic patients treated by exogenous insulin. Anti-insulin antibody induces immunological insulin resistance and poor glycaemic control. We previously reported a type 1 diabetic patient who showed severe insulin resistance due to insulin analog aspart-induced anti-insulin antibody [1]. He has been treated by using insulin aspart and insulin glargine. We treated him with the use of the newest insulin analog, insulin glulisine. This treatment significantly ameliorated his glycaemic control and anti-insulin antibody ¹²⁵I-binding rate, suggesting insulin glulisine as a possible treatment for other insulin analog-mediated immunological insulin resistance [1].

We also reported a type 2 diabetic patient (patient A) who developed severe insulin resistance due to anti-insulin antibody after 2 years of use of insulin lispro and insulin detemir [2]. Switching to the treatment with insulin glulisine and insulin glargine improved glycaemic control, however, anti-insulin antibody binding rate was still high. Finally, three pre-meal injections of insulin glulisine and discontinuation of insulin glargine (4 weeks) decreased anti-insulin an-

tibody ¹²⁵I-binding rate [2].

Basal insulin therapy using long-acting insulin analogs may be necessary for type 1 diabetic patient or type 2 diabetic patients who have no endogenous insulin secretion capacity. How can we treat these patients with long-acting insulin analogs-mediated anti-insulin antibody?

Here, we will show the changes in HbA1c and anti-insulin antibody ¹²⁵I-binding rate following the change in dose of insulin glulisine and insulin glargine in patient A (Fig. 1). Increased dose of insulin glulisine and 10 weeks-discontinuation of insulin glargine significantly decreased anti-insulin antibody ¹²⁵I-binding rate, however, fasting blood glucose level (more than 200 mg/dl) and HbA1c level showed deterioration. After 10 weeks-discontinuation of insulin glargine, we re-started the use of low dose of insulin glargine. Fasting blood glucose and HbA1c levels were promptly decreased, and interestingly, anti-insulin antibody ¹²⁵I-binding rate has been also continuously reduced.

As the treatments for anti-insulin antibody-mediated insulin resistance or hypoglycemia, in addition to our reports [1, 2], cessation of insulin administration [3], glucocorticoids [4], the combination therapy using glucocorticoids, immunosuppressant and plasmapheresis [5, 6], and insulin lispro [7, 8] have been reported (Table 1). Increasing dose of insulin glulisine and the use of low dose of insulin glargine after the discontinuation of insulin glargine for a sufficient long period may be a new treatment for the anti-insulin antibody-mediated immunological insulin resistance.

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^aDepartment of Internal Medicine, National Center for Global Health and Medicine, Kohnodai Hospital, Chiba 272-8516, Japan

^bClinical Research Center, National Center for Global Health and Medicine, Kohnodai Hospital, Chiba 272-8516, Japan

^cCorresponding author: Hidekatsu Yanai, Department of Internal Medicine, National Center for Global Health and Medicine, Kohnodai Hospital, 1-7-1 Kohnodai, Chiba 272-8516, Japan.

Email: dyanai@hospk.ncgm.go.jp

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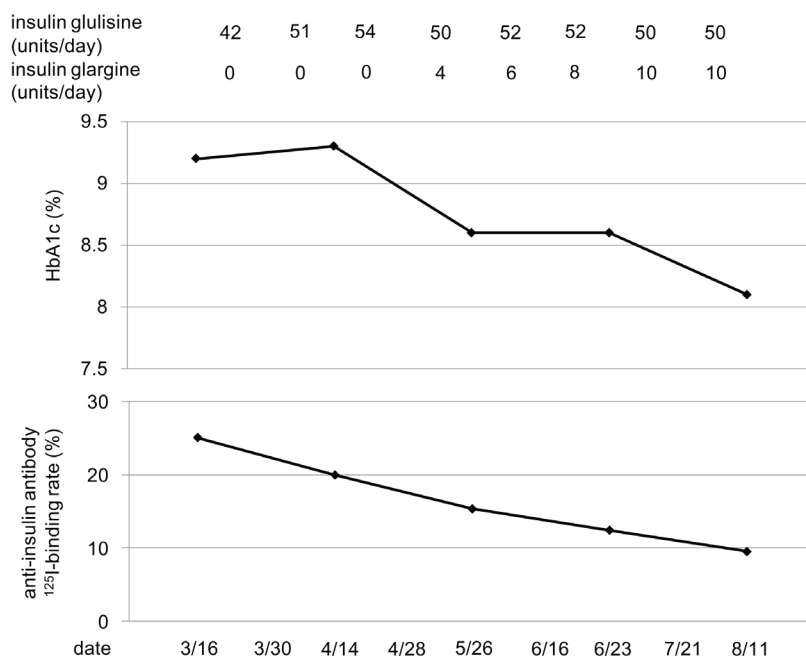


Figure 1. Changes in HbA1c and anti-insulin antibody 125I-binding rate following the change in dose of insulin glulisine and insulin glargine in anti-insulin antibody-positive insulin-treated diabetic patient.

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Table 1. Reported Treatments for Anti-Insulin Antibody-Mediated Immunological Insulin Resistance and Hypoglycemia

Cessation of insulin administration [3]
Glucocorticoids [4]
Glucocorticoids / immunosuppressant / plasmapheresis [5]
Immunosuppressant / plasmapheresis [6]
Glucocorticoids / insulin linspro [7]
Insulin lispro [8]
Insulin glulisine [1]
Insulin glulisine / cessation of long-acting insulin analogs [2]

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