News Release

Title

Higher BMI, lower HbA1c, and lower glutamic acid decarboxylase antibodies levels can predict non-insulin-dependent state for at least several years in Japanese slowly progressive insulin-dependent (type 1) diabetes mellitus patients.

Key Points

- **Patients with glutamic acid decarboxylase antibodies (GADAb) showing clinical features of type 2 diabetes are diagnosed as slowly progressive insulin-dependent (type 1) diabetes mellitus (SPIDDM) or latent autoimmune diabetes in adults (LADA) and usually progress to an insulin-dependent state in several months or years.**
- **However, some patients diagnosed as SPIDDM do not progress to an insulin-dependent state.**
- **This study demonstrated that higher BMI (≥22 kg/m^2), lower HbA1c (<9.0%), and lower GADAb levels (<10.0 U/mL) at the time of diagnosis as SPIDDM were predictors of non-insulin-dependent state in future in Japanese SPIDDM patients.**
- **Our results indicate that SPIDDM patients with the above three factors can be followed up without insulin therapy.**

Summary

Patients with glutamic acid decarboxylase antibodies (GADAb) showing clinical features of type 2 diabetes usually progress to an insulin-dependent state in several months or years. They are diagnosed as slowly progressive insulin-dependent (type 1) diabetes mellitus (SPIDDM) or latent autoimmune diabetes in adults (LADA), a subtype of adult-onset autoimmune diabetes. However, some patients diagnosed with adult-onset autoimmune diabetes do not progress to an insulin-dependent state. Therefore, we conducted a retrospective cohort study to identify non-insulin-dependent diabetes among SPIDDM patients using measurable indicators in daily clinical practice. We surveyed the data from the electronic medical records of all the patients with GADAb from eight medical centers in Japan in order to select and analyze patients who matched the diagnostic criteria of SPIDDM. A total of 345 patients were analyzed, and 162 among them started insulin therapy while 183 did not during the follow-up period (the mean 3.0 years). A Cox proportional hazards model showed that BMI, HbA1c levels, and GADAb levels were independent factors for progression to insulin therapy. Kaplan–Meier analyses revealed that 86.0% of the SPIDDM patients who had all the three factors (BMI ≥ 22 kg/m^2, HbA1c <9.0%, and GADAb <10.0 U/mL) did not require insulin therapy for 4 years. This study demonstrated that higher BMI (≥22 kg/m^2), lower HbA1c (<9.0%), and lower GADAb levels (<10.0 U/mL) can predict non-insulin-dependent state

for at least several years in Japanese SPIDDM patients with GADAb. Our results indicate that patients with the above three factors can be followed up without insulin therapy.

Research Background

Patients with GADAb showing clinical features of type 2 diabetes in the beginning usually progress to an insulin-dependent in several months or years. They are diagnosed as SPIDDM or LADA, a subtype of adult-onset autoimmune diabetes. While insulin therapy has been recommended for these patients in order to prevent islet beta cell failure, there are some patients diagnosed with adult-onset autoimmune diabetes who do not progress to an insulin-dependent state. Moreover, it is noteworthy that insulin therapy could enhance hypoglycemia, increase weight, and induce insulin antibodies in the blood. Therefore, it is important to differentially identify non-insulin-dependent diabetes among patients diagnosed with adult-onset autoimmune diabetes and to consider treatment other than insulin therapy for these patients.

In this retrospective cohort study, we sought to identify non-insulin-dependent diabetes among SPIDDM patients using factors that have been widely used in routine clinical practice.

Research Results

We surveyed the data from the electronic medical records of all the patients with GADAb from eight medical centers in Japan in order to select and analyze patients who matched the diagnostic criteria of SPIDDM and who were clinically followed over the long term, from the diagnosis of SPIDDM to the initiation of insulin therapy. A total of 345 patients were analyzed, and 162 among them started insulin therapy (insulin therapy group) while 183 did not (non-insulin therapy group) during the follow-up period (the mean 3.0 years). Patients in the non-insulin therapy group were more likely to be male and had a later diabetes onset, a shorter duration of diabetes, higher body mass index (BMI), higher blood pressure levels, lower HbA1c levels, lower GADAb levels, and less usage of antidiabetic agents than those in the insulin therapy group at the time of diagnosis as SPIDDM. A Cox proportional hazards model showed that BMI, HbA1c levels, and GADAb levels were independent factors for progression to insulin therapy. Kaplan–Meier analyses revealed that 86.0% of the SPIDDM patients who had all the three factors (BMI $\geq$ 22 kg/m^2, HbA1c <9.0%, and GADAb <10.0 U/mL) did not require insulin therapy for 4 years.

Research Summary and Future Perspective

This study demonstrated that higher BMI ($\geq$22 kg/m^2), lower HbA1c (<9.0%), and lower GADAb levels (<10.0 U/mL) can predict non-insulin-dependent state for at least several years in Japanese SPIDDM patients with GADAb. Our results indicate that patients with the above three factors can be followed up without insulin therapy. Since this was a retrospective study, prospective studies are needed to confirm the efficacy of the factors identified in this study.

Publication

Adult-onset autoimmune diabetes identified by glutamic acid decarboxylase autoantibodies: a retrospective cohort study

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