P-0814 – Factors associated with subsequent glycemic control in patients who discontinued diabetes care

Noriko Ihana-Sugiyama¹, Takehiro Sugiyama^{1,2,3,4}, Kenjiro Imai¹, Ayako Yanagisawa^{1,2}, Hirokazu Tanaka^{1,2}, Kohjiro Ueki⁵, Nanako Tamiya⁴, Yasuki Kobayashi², Mitsuru Ohsugi¹

¹ Diabetes and Metabolism Information Center, Research Institute, National Center for Global Health and Medicine

² Department of Public Health/Health Policy, Graduate School of Medicine, the University of Tokyo

³ Health Services Research and Development Center, University of Tsukuba

⁴ Department of Health Services Research, Faculty of Medicine, University of Tsukuba

⁵ Diabetes Research Center, Research Institute, National Center for Global Health and Medicine

Introduction

Discontinuation of diabetes care devastates glycemic control and causes complications; however, few studies have investigated the effects of discontinuation on subsequent glycemic control and its associated factors. The aim of this study was to estimate the effects of discontinuation on subsequent glycemic control and to investigate its associated factors.

Methods

This retrospective cohort study included data from health insurance claims and health checkups provided by employer-sponsored health insurers in Japan via the JMDC Co., Ltd between January 2005 and April 2018.

Patients with diabetes were identified according to antidiabetic medication prescription at least once during the follow-up or a glycohemoglobin (HbA1c) level of $\geq 6.5\%$ at baseline health checkups.

Patients who continued diabetes care (with HbA1c/glycoalbumin measurements and/or antidiabetic medication at least once in 3 months) for ≥ 18 months and subsequently dropout of diabetes care (intermission or cessation of treatment for >3 months) were included, considering that most frequent medical care intervals for outpatient visits were ≤ 3 months in Japan. We included patients with HbA1c levels and BMI obtained from the health checkup data at both ≤ 12 months before and ≤ 24 months after the month (Fig. 1).

Patients were divided into three groups according to the baseline HbA1c levels: Group 1, $<7.0\%$; Group 2, $\geq 7.0\% - 8.0\%$; and Group 3: $\geq 8.0\%$.

A one-way analysis of variance was used to evaluate changes in HbA1c levels. Multiple logistic regression analysis was used to investigate factors related to higher HbA1c levels after the dropout (HbA1c of $\geq 8\%$) and baseline characteristics.

Results

Among 141,010 patients, 16.5% discontinued diabetic treatment during the observation. 2,161 of them had information from medical checkups. 56.0% received antidiabetic medication at the dropout month (Fig. 2). The mean (standard deviation) age, baseline HbA1c, and baseline BMI was 52.1 (8.0) years, 6.8 (1.2%), and 26.2 (4.5), respectively. During the dropout period, HbA1c levels and BMI were 7.4% (1.9%) and 26.0 (4.5), respectively (Table 1). Changes in HbA1c levels were significantly different among the groups (Group 1, 0.47%; Group 2, 0.87%; and Group 3, 0.66%; $P < 0.001$; Fig. 2A). Follow-up HbA1c levels were also different among the groups (Fig. 3B).

Higher baseline HbA1c levels and a BMI of >25 , a longer interval between the dropout month and the follow-up health checkup, and antidiabetic medication use, particularly sulfonylurea and insulin, were associated with poor glycemic control after dropping out (Table 2).

Table 1. Characteristics of patients included in this study

	N = 2,161
Age, year	52.1 (8.0)
Sex, male	1,878 (86.9)
Type of diabetes	
Type 1	11 (5.0)
Type 2 / others	2,150 (95.0)
Baseline HbA1c, %	6.8 (1.2)
Baseline BMI	26.2 (4.5)
Non-intermittent of diabetes care before the dropout, month	32.9 (17.0)
Antidiabetic medication	
No antidiabetic medication	951 (44.0)
Any antidiabetic medication	1,210 (56.0)
Sulfonylurea	283 (13.1)
Insulin	114 (5.3)
Both sulfonylurea and insulin	10 (0.5)
Antidiabetic drug excluding sulfonylurea and insulin	878 (38.4)
Biganide	518 (24.0)
Dipeptidyl peptidase-4 inhibitors	715 (33.1)
Sodium glucose cotransporter 2 inhibitors	120 (5.6)
Alpha glucosidase inhibitors	189 (8.8)
Thiazolidine	193 (8.9)
Glucagon-like peptide-1 receptor agonist	22 (1.0)
HbA1c during dropout, %	7.4 (1.9)
BMI during dropout	26.0 (4.5)
Interval from the dropout month to follow-up health examination, month	7.6 (6.5)

Figure 1 Study design

Total number of patients who continued diabetic treatment more than 18 months during the observation period. N = 141,010

Patients who discontinued diabetic treatment > 3 months during the observation period. N = 57,532

Patients who ended observation period or canceled the insurance within 3 months after discontinuing diabetic treatment. N = 34,276

Dropout patients. N = 23,256

Patients who did not have medical checkup information. N = 18,927

Patients who had medical checkup information before and after the dropout. N = 4,329

Patients included in this study. N = 2,161

- Patients who received antidiabetic drugs at the dropout month. (N = 1,210)
- Patients who had not received antidiabetic drugs during observation period and HbA1c $\geq 6.5\%$ at the baseline medical checkup. (N = 951)

Patients who had not received antidiabetic drug during the observation period and HbA1c $< 6.5\%$ at the baseline medical checkup. N = 2,168

Fig. 2 Flow chart of patients selection.

Table 2. Multivariable analysis investigating factors associated with poor glycemic control (HbA1c $\geq 8\%$) during the dropout period.

	Odds ratio	95% Conf. Interval	P value
Baseline HbA1c	3.83	3.26 – 4.49	< 0.001
Baseline BMI > 25	1.37	1.03 – 1.83	0.029
Sex	1.03	0.67 – 1.83	0.896
Interval from the dropout month to follow-up health examination	1.08	1.05 – 1.10	< 0.001
Antidiabetic medication			
No medication	–		
Antidiabetic drug excluding sulfonylurea and insulin	3.99	2.84 – 5.60	< 0.001
Sulfonylurea	10.16	6.04 – 14.28	< 0.001
Insulin	6.51	4.19 – 14.41	< 0.001

Odds ratios adjusted for age, sex, baseline HbA1C, baseline BMI, interval between baseline health examination and dropout interval between dropping out and follow-up health examination, and antidiabetic drugs.

Figure 3 Change and follow-up HbA1c during the dropout period

A. Change HbA1c (%) B. Follow-up HbA1c (%)

Discussion

Baseline HbA1c, baseline BMI, and types of antidiabetic medication were associated with poor HbA1c levels after the dropout period. Predictors of poor glycemic control are indicators that identify patients at risk. These predictors may help medical staff and insurers intervene in dropout patients who have these risks.