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Suboptimal glycaemic control in patients with type 2 diabetes: retrospective data from 22,272 individuals

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Background and aims: Despite clinical guideline recommendations, glycaemic control in patients with type 2 diabetes remains suboptimal. Understanding treatment patterns and associated outcomes is crucial to address this issue.

Materials and methods: As part of the DISCOVER programme, a retrospective cohort study was conducted using data from electronic medical records in Canada, France, Germany and the UK. Patients with type 2 diabetes initiating second-line antidiabetic therapy (baseline) and with ≥ 6 months of follow-up were assessed for their characteristics and response to treatment.

Results: We identified 22 272 patients who initiated a second-line therapy (add-on therapy or switch from one therapy to another) from February 2011 to April 2014. Table 1 shows median HbA_{1c} levels for patients who remained on second-line treatment for ≥ 6 months; overall 44.6% achieved HbA_{1c} < 7.0% at 6 months. The most frequently used second-line treatments were dipeptidyl peptidase-4 (DPP4) inhibitors or sulphonylureas, with metformin. The proportion of patients achieving HbA_{1c} < 7.0% was slightly higher with the former (45.4%) than with the latter (41.0%).

Conclusion: Although all assessed therapies were associated with a decrease in median HbA_{1c} at 6 months, more than 50% of patients still had HbA_{1c} levels ≥ 7.0%. The 3-year follow-up period of the DISCOVER study will provide valuable data on longer-term glycaemic control.

Table 1. Glycaemic control in patients receiving second-line therapy for ≥ 6 months

Second-line therapy[a]	n (%)[d]	Median HbA_{1c} (IQR), %[e] At baseline[f]	At 6 months	Proportion with HbA_{1c} < 7% at 6 months, %[e]
Metformin monotherapy	443 (89.9)	7.6 (6.8–8.9)	6.8 (6.3–7.4)	57.1
DPP-4i monotherapy	745 (83.5)	7.4 (6.6–8.1)	6.9 (6.3–7.5)	53.8
SU monotherapy	1486 (90.1)	7.9 (7.2–8.9)	6.9 (6.4–7.6)	50.2
Metformin and DPP-4i[b]	5422 (79.1)	7.9 (7.4–9.0)	7.1 (6.5–7.7)	45.5
Metformin and SU[c]	7304 (83.3)	8.6 (7.8–10.0)	7.2 (6.6–8.0)	41.0
All other therapies	3086 (85.4)	8.4 (7.3–10.3)	7.0 (6.4–8.0)	46.5
Overall	18 486 (83.0)	8.2 (7.5–9.6)	7.1 (6.5–7.8)	44.6

[a]Add-on therapy or switch from one therapy to another.
[b]Patients for whom a DPP-4i was added to metformin or patients who switched to this combination therapy from other first-line treatments.
[c]Patients for whom a SU was added to metformin and patients who switched to this combination therapy from other first-line treatments.
[d]Numbers and proportions of patients who remained on second-line therapy for ≥ 6 months.
[e]For patients who remained on second-line therapy for ≥ 6 months.
[f]Initiation of second-line therapy (add-on therapy or switching from one therapy to another).
DPP-4i: dipeptyl-peptidase 4 inhibitor; IQR: interquartile range; SU: sulphonylurea.

Clinical Trial Registration Number: NCT02322762, NCT02226822
Supported by: AstraZeneca
Disclosure: **A. Nicolucci:** Grants; Novo Nordisk, Artsana. Honorarium; AstraZeneca, Novo Nordisk, Sanofi-Aventis.

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Differences in persistence by class of oral therapy for the treatment of type 2 diabetes

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Background and aims: Higher rates of adherence and persistence to antihyperglycaemic medications among patients with type 2 diabetes (T2DM) are associated with improved glycaemic control, reduced cardiovascular events and mortality, and reduced costs. Sub-optimal adherence is a significant problem for those managing and living with T2DM, with rates routinely reported as ranging between 60-80% depending on the medication class, patient population, and environment. While adherence is acknowledged as a multi-factorial predicament, medication factors are an important dimension. We compared medication persistence across all commonly used non-insulin medication classes used for treatment of type 2 diabetes.

Materials and methods: We performed a retrospective cohort analysis using a primary care based population (Royal College of General Practitioners Research and Surveillance Centre cohort). We identified prescriptions for all medication classes utilised by people with T2DM between 1st January 2004 and 31st July 2015. We compared crude median, first time, persistence across each class with non-persistence defined as prescription gap of ≥ 90 days. We also compared non-persistence between classes, adjusted for known confounders of adherence, using Cox regression. Confounders included: age, gender, ethnicity, socioeconomic status, alcohol use, smoking status, glycaemic control, duration of diabetes, diabetes complications, comorbidities, number of previous and concurrent diabetes medications. The analysis was performed using R version 3.2.3.

Results: From 58,717 people with T2DM and a median duration of follow up, since diagnosis of T2DM, of 6.75 (IQR 7.58) years we identified 78,524 prescriptions for new medications. Metformin and sulphonylureas were the most commonly initiated and had the longest crude median persistence of 2.78 (95% CI 2.72-2.85) years and 2.16 (2.09-2.24) years, respectively. Early data for sodium glucose co-transporter-2 (SGLT2) inhibitors show good persistence however median rates had not yet been reached. In regression models shorter persistence was associated with younger age, non-white ethnicity, extremes of HbA1c, peripheral neuropathy, renal disease, dementia, depression, heart failure, and a higher number previous diabetes medications. Longer persistence was associated with hypertension, and a higher number of concurrent diabetes medications. After adjusting for confounders, non-persistence with SGLT2 inhibitors was similar to metformin (HR 1.06; 95% CI 0.93-1.20). All other classes had higher non-persistence rates: sulphonylureas (HR 1.23; 1.20-1.25), dipeptidyl peptidase-4 inhibitors (HR 1.50; 1.45-1.55), thiazolidinediones (HR 1.61; 1.55-1.67), meglitinides (HR 1.93; 1.75-2.13), alpha-glucosidase inhibitors (HR 1.83; 1.60-2.10).

Conclusion: There is considerable variability in persistence between medication classes after adjusting for important confounders. These data will help facilitate proficient medication selection from the vast array of therapies currently available. We plan further work to understand the factors underlying these differences including a qualitative analysis of behavioural and attitudinal factors not available from electronic records.

Supported by: Eli Lilly and Company
Disclosure: **A.P. McGovern:** Grants; Eli Lilly.