Metabolic Monitoring among Patients with Type 2 Diabetes Prescribed Second Generation Antipsychotics

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INTRODUCTION

Background

- Usage of second-generation antipsychotics (SGA) is associated with a higher risk of iatrogenic weight gain and adverse changes in glucose and lipid metabolism relative to first-generation antipsychotics (FGA).
- Since 2004, professional societies recommend routine monitoring of weight, glycemia, and lipids as well as screening for diabetic complications among individuals with type 2 diabetes (T2D) prescribed SGAs.
- There are no longitudinal studies of metabolic monitoring at the population-level among adults with T2D prescribed antipsychotics.

Primary Objective

- This study aims to examine metabolic monitoring in the three years after the first SGA prescription following T2D diagnosis, relative to those prescribed FGA and neither.

METHODS

Study Population

- Data were obtained from adults (≥18 years) in the Epic Cosmos Research Platform.
- Patients with newly diagnosed T2D between Jan 2012-Dec 2021 were categorized within two years following their diagnosis of T2D as those who were prescribed SGAs, no SGA but FGAs, and neither SGA nor FGA.
- The final analytic sample consisted of 469,503 individuals from 50 states and DC.

Exposures and Outcomes

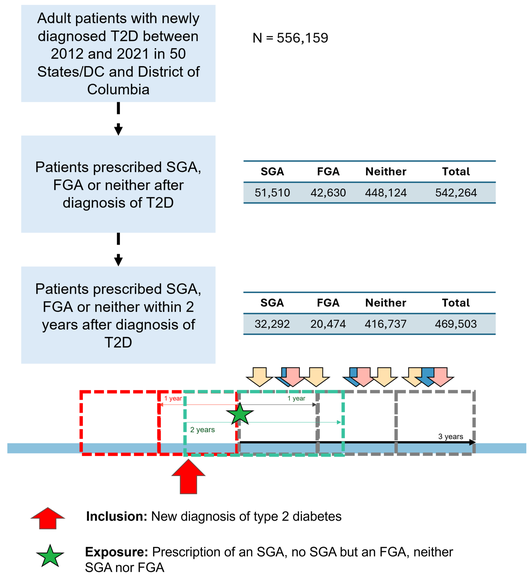
- We identified individuals who were prescribed an SGA, those who were prescribed an FGA but not an SGA, and those who received neither within two years after their T2D diagnosis.
- We defined the outcome of interest as annual monitoring for HbA1c, weight, LDL cholesterol, and renal function for each of the three years after index prescription.

Statistical Analysis

- We conducted a longitudinal analysis to estimate the covariate-adjusted rates (%) of metabolic monitoring using generalized estimating equations, with statistical interaction for time since index prescription.

RESULTS

Study Cohort

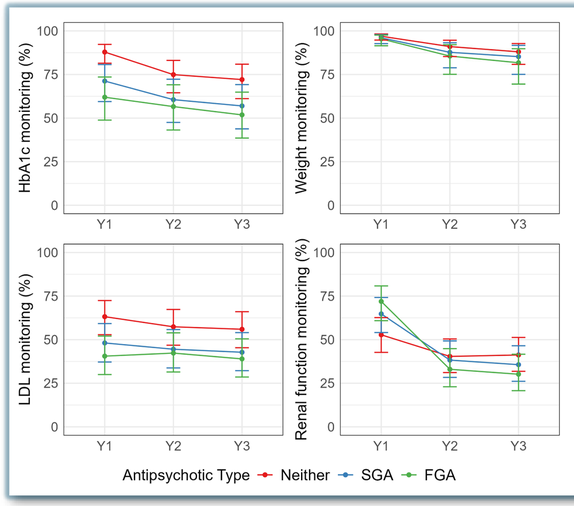


DEMOGRAPHICS

	Total	None	SGA	FGA
Unique patients	469,503	416,737 (88.8%)	32,292 (6.9%)	20,474 (4.4%)
Age at the first prescription of SGA	63.8 (13.1)	63.7 (12.9)	63.0 (14.7)	66.7 (14.2)
Age at T2D diagnosis	63.7 (13.1)	63.7 (12.9)	62.6 (14.7)	66.1 (14.2)
Duration between T2D diagnosis and index prescription (months)	0 (0, 3.1)	0 (0, 3.0)	1.0 (0, 9.2)	5.1 (0, 14.2)
Female	241,777 (51.5%)	213,060 (51.1%)	18,142 (56.2%)	10,629 (51.9%)
Insurance				
Medicare	190,949 (43.0%)	166,463 (41.8%)	14,781 (53.4%)	9,705 (52.7%)
Medicaid	35,961 (8.1%)	29,859 (7.5%)	4,170 (15.1%)	1,932 (10.5%)
Other/Private	2,786 (0.6%)	2,657 (0.7%)	68 (0.3%)	61 (0.3%)
Age-adjusted Charlson Comorbidity Index category[a]				
Mild (0-3)	236,689 (50.4%)	218,832 (52.5%)	12,400 (38.4%)	5,457 (26.7%)
Moderate (4-6)	112,568 (24.0%)	100,564 (24.1%)	7,069 (21.9%)	4,935 (24.1%)
Severe (≥7)	120,246 (25.6%)	97,341 (23.4%)	12,823 (39.7%)	10,082 (49.2%)
Prescriber specialty of index				
Psychiatry or Behavioral Health[b]	4,082 (3.1%)	1,058 (1.2%)	2,703 (10.8%)	371 (1.8%)
Primary Care or Internal Medicine[c]	58,538 (44.6%)	45,889 (53.3%)	9,017 (36.1%)	3,622 (18.0%)
Other Specialty[d]	39,660 (30.2%)	19,019 (22.1%)	9,533 (38.2%)	11,108 (55.1%)
Unspecified	29,002 (22.1%)	20,178 (23.4%)	3,713 (14.9%)	5,111 (25.4%)
Number of in-person encounters				
Year 1	8 (4, 16)	8 (4, 15)	12 (6, 24)	13 (5, 26)
Year 2	8 (4, 15)	8 (4, 15)	10 (5, 21)	11 (5, 21)
Year 3	8 (4, 15)	8 (4, 15)	10 (5, 20)	9 (4, 19)
Screening for retinopathy				
Year 1	22,832 (4.9%)	20,778 (5.0%)	1,209 (3.7%)	845 (4.1%)
Year 2	22,799 (4.9%)	20,829 (5.0%)	1.208 (3.7%)	762 (3.7%)
Year 3	23,409 (5.0%)	21,569 (5.2%)	1,138 (3.5%)	702 (3.4%)

a The Age-adjusted Charlson Comorbidity Index (ACCI) was calculated for each patient based on 17 comorbid conditions: myocardial infarction, congestive heart failure, peripheral vascular disease, cerebrovascular disease, dementia, chronic pulmonary disease, rheumatic disease, peptic ulcer disease, mild liver disease, diabetes without chronic complication, diabetes with chronic complication, hemiplegia or paraplegia, renal disease, any malignancy (including lymphoma and leukemia, except malignant neoplasm of skin), moderate or severe liver disease, metastatic solid tumor and AIDS/HIV. The ACCI incorporates age as a corrective variable by adding one point for each decade over 40 years of age. The total ACCI score was categorized as: 0–3 points (mild), 4–6 points (moderate), and ≥7 points (severe).
b Includes Psychiatry, Behavioral Health and Mental Health providers
c Includes Internal Medicine, Family Medicine, Endocrinology, Nurse Practitioner, General Practice, Geriatric Medicine, Diabetes Services, Gerontology, Preventative Medicine
d Includes Emergency Medicine, Anesthesiology, General Surgery, Orthopedic Surgery, Urology, Neurology, Cardiology, Pulmonary Disease, Hospital Medicine, Neurosurgery, Respiratory Therapy, Medical Specialty, Hematology and Oncology

Annual rates of monitoring



After adjusting for socio-demographic covariates, Age-adjusted Charlson Comorbidity Index and encounter frequency, there were no differences in weight monitoring by prescription in Years 1 to 3. Relative to those prescribed neither SGA nor FGA, renal function was monitored more frequently among patients prescribed SGAs and FGAs only in Year 1, while HbA1c and LDL were monitored less frequently for all years.

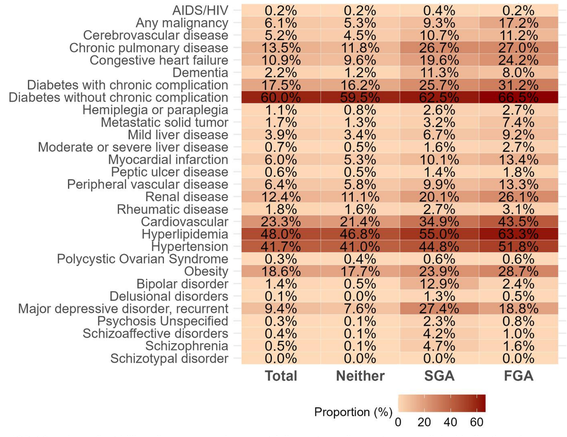
SIGNIFICANCE

This study, using a cohort of 469,503 patients from the Epic Cosmos platform, is among the largest analysis to date examining metabolic monitoring in individuals with newly diagnosed T2D prescribed antipsychotics.

Our findings reveal a progressive decline in the monitoring of vital signs, laboratory markers, and screening for complications following antipsychotic prescriptions. Such critical gaps in real-world care may compromise timely detection and management of T2D complications in this high-risk population.

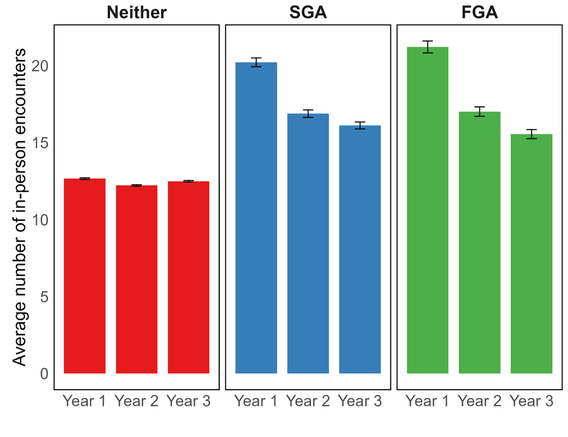
Comorbidity & In-person Encounters

Comorbidity (%) in two years prior to the index prescription: ICD-10-CM billing codes



*ICD-10 codes reflect billing diagnoses and may not fully capture all symptoms or clinical indications for which SGAs were prescribed during patient encounters.

Average number of in-person encounters after index prescription



*In-person encounters are defined as one of outpatient face to face visits, hospital admissions, or hospital outpatient visits..

DISCUSSION

- Our findings highlight the need for innovative, generalizable strategies for metabolic monitoring, especially among patients prescribed antipsychotics.
- Limitation of this study include unavailability of data on metabolic monitoring in non-Epic Cosmos participating hospitals.
- Given the high frequency of in-person encounters observed in our sample, these visits represent critical opportunities to recommend and implement routine T2D monitoring among individuals prescribed antipsychotics.