Adherence Trajectories in Medicaid Drug-Naïve Type 2 Diabetes Patients: A Comparative Study between Initial Combination Therapy and Step-Therapy Approaches

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BACKGROUND

- Combination therapy is emerging as an important treatment option among type 2 diabetes (T2D) patients, given its potential advantages over step-therapy, including a faster and more pronounced reduction in glycated hemoglobin (HbA1c).
- While clinical trials offer valuable insights into the efficacy of early combination treatments in diabetes management, they have limitations in studying medication adherence behaviors.
- Long-term adherence to antidiabetic medications (ADMs) is critical for effective diabetes management, contributing to enhanced glycemic control, reduced risks of macro- and microvascular complications, and consequent reductions in healthcare resource utilization and costs.
- The initial approach to pharmacotherapy selection may influence patients' medication adherence behavior.

OBJECTIVE

- This study aims to assess the impact of the initial combination therapy approach vs. step-therapy on adherence trajectories during the first 12 months of antidiabetic treatment initiation among Medicaid drug naïve Type 2 Patients.

METHODS

Study Design: Retrospective cohort study (Figure 1)

Data Source: Administrative claims (Merative™ MarketScan®) Medicaid

Inclusion Criteria:

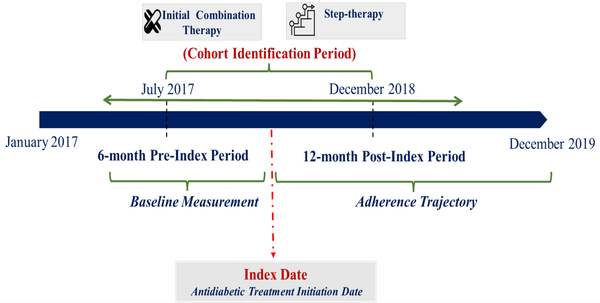
- ☑ T2D patients ≥18 years old at the index date
- ☑ Drug-naïve with no pharmacy claims for ADMs during the pre-index period
- ☑ Continuous enrollment in medical and pharmacy plans during the pre- and post-index period

Exclusion Criteria:

- ☒ Diagnosis of pregnancy, gestational diabetes, secondary diabetes, or type I diabetes
- ☒ History of malignancy, polycystic ovarian syndrome, organ transplant, end-stage renal disease, or HIV/AIDS
- ☒ Insulin therapy or triple therapy as the index treatment regimen

- SAS version 9.4 (SAS Institute, Cary, NC)

Figure 1. Study Design



Statistical Analysis

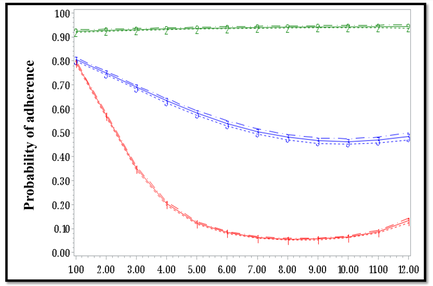
Descriptive statistics
Chi-square and ANOVA

Multinomial Logistic Regression model
Outcome: Trajectory groups with "adherent" trajectory as reference

Adherence measurement

- For a 12-month follow-up period, the monthly proportion of days covered (PDC) was measured with PDC ≥ 0.80 considered adherent
- 12 binary indicators of monthly adherence modeled into a logistic Group Based Trajectory Model

Figure 2. Group-Based Trajectories for Medicaid Population



Trajectory Groups	Percent
Adherent	29.7
Gradual Decline	33.5
Rapid Decline	36.8

RESULTS

Table 1. Baseline Characteristics of the Medicaid Population

Variable	All Patients (N=18,295)	Rapid Decline (n=6856)	Adherent (n=5654)	Gradual Decline (n=5785)	P value
Study group					0.001
Initial Combination therapy	1676 (9.2)	732 (10.70)	462 (8.20)	482 (8.33)	
Step-therapy	16,619 (90.8)	6124 (89.30)	5192 (91.80)	5303 (91.67)	
Age group					0.001
18-34	2363 (12.9)	1238 (18.1)	481 (8.5)	644 (11.1)	
35-44	4221 (23.1)	1843 (26.9)	1064 (18.8)	1314 (22.7)	
45-54	5655 (30.9)	1958 (28.6)	1803 (31.9)	1894 (32.7)	
55-64	5431 (29.7)	1632 (23.8)	2064 (36.5)	1735 (30.0)	
65 and older	625 (3.4)	185 (2.7)	242 (4.3)	198 (3.4)	
Gender					0.001
Male	6902 (37.7)	2404 (35.1)	2276 (40.3)	2222 (38.4)	
Female	11393 (62.3)	4452 (64.9)	3378 (59.7)	3563 (61.6)	
Plan type					0.001
Comprehensive	7115 (38.9)	2955 (43.1)	1925 (34.0)	2235 (38.6)	
HMO	11,053 (60.4)	3878 (56.6)	3677 (65.0)	3498 (60.5)	
PPO/POS with Capitation	127 (0.7)	23 (0.3)	52 (0.9)	52 (0.9)	
Race					0.001
White	8997 (49.2)	2813 (41.0)	3363 (59.5)	2821 (48.8)	
Black	6091 (33.3)	2941 (42.9)	1254 (22.2)	1896 (32.8)	
Hispanic	391 (2.1)	154 (2.3)	98 (1.7)	139 (2.4)	
Other	757 (4.1)	213 (3.1)	264 (4.7)	280 (4.8)	
Unknown	2059 (11.3)	735 (10.7)	675 (11.9)	649 (11.2)	
Comorbidities					
CAD	1386 (7.6)	469 (6.8)	473 (8.3)	444 (7.7)	0.005
MI	254 (1.4)	93 (1.4)	82 (1.4)	79 (1.4)	0.8908
Stroke	381 (2.1)	111 (1.6)	147 (2.6)	123 (2.1)	0.006
CKD	511 (2.8)	156 (2.3)	182 (3.2)	173 (3.0)	0.0034
Dementia	115 (0.6)	23 (0.3)	64 (1.1)	28 (0.5)	0.001
Depression	4077 (22.3)	1433 (20.9)	1364 (24.1)	1280 (22.1)	0.001
HF	1015 (5.6)	373 (5.4)	317 (5.6)	325 (5.6)	0.8859
Hyperlipidemia	7788 (42.6)	2539 (37.0)	2737 (48.4)	2512 (43.4)	0.001
Hypertension	11,449 (62.6)	4043 (59.0)	3724 (65.9)	3682 (63.6)	0.001
Obesity	6092 (33.3)	2346 (34.2)	1870 (33.0)	1876 (32.4)	0.0949
Hospitalization	1956 (10.7)	782 (11.4)	590 (10.4)	584 (10.1)	0.0448
Endocrinology Visit	142 (0.8)	52 (0.8)	41 (0.7)	49 (0.8)	0.7423
Refill Type					0.0002
≥ 90-day	296 (1.6)	21 (0.3)	143 (2.5)	132 (2.3)	
Number of non-diabetic medications, mean (SD)	2.2 (2.5)	2.27 (2.5)	2.13 (2.6)	2.21 (2.5)	0.0054
CCI Score, mean (SD)	1.4 (1.1)	1.46 (1.1)	1.37 (1.1)	1.4 (1.1)	0.001

- All variables are statistically significant difference P value <0.05, or <0.01
- CAD Coronary Artery Disease, CCI Charlson Comorbidity Index, CDHP Consumer-Driven Health Plan, CKD Chronic Kidney Disease ,EPO Exclusive Provider Organization, HDHP High-Deductible Health Plan, HF Heart Failure, HMO Health Maintenance Organization, MI Myocardial Infarction, POS Point-of-Service, PPO Preferred Provider Organization, SD Standard Deviation

Table 2. Validation of the Chosen Group-Based Trajectories Model

Trajectory Group	Number Assigned	Proportion Assigned to Each Group	AvePP	OCC	Estimated Group Probabilities	|π−P|
Rapid Decline	6,856	0.374	0.91	20.33	0.368	0.006
Adherent	5,654	0.309	0.92	29.40	0.297	0.012
Gradual Decline	5,785	0.316	0.90	15.30	0.335	0.01

Abbreviations: (AvePP) average probability (≥ 0.7), (OCC) odds of correct classification (> 5), (P) actual proportion of subjects assigned to each trajectory, (π) posterior probability of group membership.

Multinomial Logistic Regression Model Results

- Patients receiving initial combination therapy were more likely to follow a rapid decline trajectory than the step-therapy group (OR 1.32, 95% CI 1.16-1.50).
- Other Significant predictors associated with rapid decline trajectory included age, gender, health plan type, race, comorbidities, previous hospitalization, refill-type, number of non-diabetic medications, and Charlson-comorbidity index (CCI) score.

DISCUSSION

- This observational study addresses a significant gap in understanding real-world adherence patterns between initial combination therapy and conventional step-therapy in treating T2D patients.
- Our results suggest that new type 2 diabetes patients that begin diabetes treatment with step-therapy demonstrate higher adherence levels compared to those initiating treatment with combination therapy.
- Furthermore, study findings showed that several potential factors may contribute to improved adherence with step-therapy compared to combination therapy.

CONCLUSION

Findings suggest better adherence patterns among patients receiving step-therapy compared to those receiving initial combination therapy during one-year post-treatment initiation.

Further research should investigate underlying factors for the observed difference between step therapy and initial combination therapy, as well as their respective impact on clinical outcomes.