HSD97

Automated Versus Manual Prior Authorization for Type 2 Diabetes Mellitus Drugs: A Retrospective Study from Israel

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Background:

Although drug prior authorization (PA) is necessary for both medical and economic control, it imposes significant bureaucratic and economic burden on healthcare service providers and payers and reduces patients' adherence to treatment.[1-11] A novel automated PA system **(Figure 1)**, originally developed by Meuhedet for Type 2 diabetes mellitus (T2DM) drugs may improve these drawbacks.

Objective:

To examine the performance of automated real-time PA system compared to a manual PA in terms of accessibility, adherence to treatment and PA staff's worktime overload, using Sodium-Glucose co-transporter 2 inhibitors (SGLT2i) and Glucagon-like Peptide-1 analogs (GLP1-A) as representative cases.

Methods:

A historical cohort study from Meuhedet, a large health maintenance organization in Israel, compared manual versus automated PA mechanisms for T2DM drugs: SGLT2i and GLP1-A. The intervention group included T2DM patients who met the Israeli health basket's criteria for reimbursement of either SGLT2i or GLP1-A and whose first drug application was approved using the automated system. The control group included similar patients whose applications were approved by manual PA. The primary endpoint was the time elapsed from application's submission to prescription's fulfillment (defined as "accessibility time"). Secondary endpoints included prescription fulfillment rate at 7- and 30-days post-approval; change in manual applications number following the automated system's introduction; and direct costs savings attributed to the automated PA operation. We used chi-square test for comparing categorical variables, and Mann-Whitney test for non-normally distributed continuous variables. We used conditional logistic regression to analyze the contributing variables for prescription fulfillment within 7 and 30 days. All the statistical tests were two sided with p-value<0.05 considered as significant. The statistical analysis was performed using R version 4.1.0 (R Foundation for Statistical Computing).

Results:

1371 automated approved prescriptions and 1240 manually approved prescriptions were included in the analysis. Median accessibility time was 1 day (IQR 0-5) with automated PA for both GLP1-A and SGLT2i, compared with 4 days (IQR 1-9) and 3 days (IQR 1-8), respectively, with the manual PA (p <0.001). 84% of GLP1-A automated PA approvals were filled within 7 days compared with 70% with manual PA (p<0.001) (**Figure 2A**). Similar results were seen with SGLT2i (80% vs. 72%, p<0.008) (**Figure 2B**). No differences were observed at 30 days post-approval. Using logistic regression, odds for GLP1-A and SGLT2i prescription fulfillment within 7 days were 2.36 and 1.53 folds higher (respectively) with the automated PA (p<0.01) (**Tables 1,2**). The automated PA system reduced the total number of manual PA applications by 40%, cutting annual administrative costs by 566 thousand US dollars.

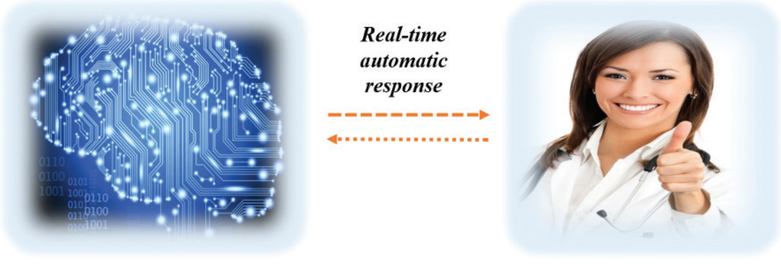

Figure 1: Real-time automated PA system. Upon submission of an application for a drug by the physician, the system receives multiple data inputs from the electronic medical record and analyzes them using an algorithm to produce an immediate response (approval or rejection) according to the health basket's reimbursement criteria. PA = prior authorization

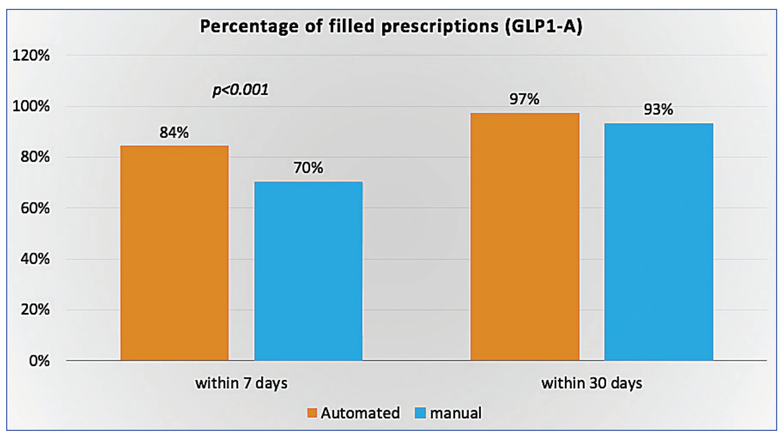

Figure 2A: Percentage of filled prescriptions for GLP1-A within 7 and 30 days from drug approval. GLP1-A = Glucagon-like Peptide-1 analogs

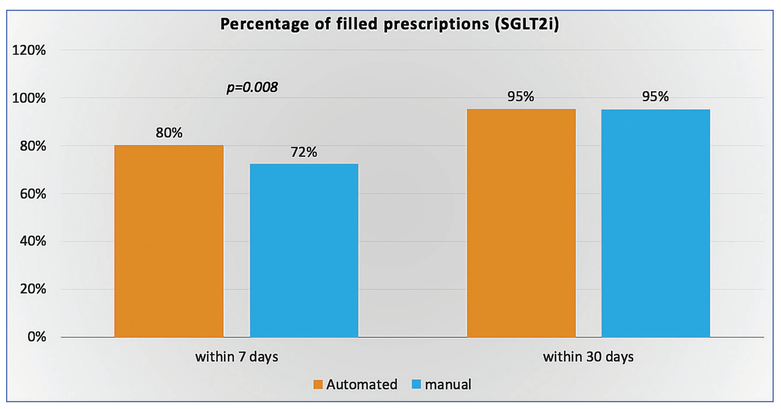

Figure 2B: Percentage of filled prescriptions for SGLT2i within 7 and 30 days from drug approval. SGLT2i = Sodium-Glucose co-transporter 2 inhibitors

GLP1-A prescription fulfillment predictors	within one week			within one month		
	OR	95% CI	p-value	OR	95% CI	p-value
PA type (automated vs. manual)	2.36	1.81 - 3.09	<0.001	2.68	1.58 - 4.70	<0.001
Advanced age	1.00	0.99 - 1.02	0.52	1.00	0.98 - 1.03	0.94
Male gender	1.06	0.81 - 1.38	0.69	1.35	0.81 - 2.26	0.24
Socioeconomic status	1.08	1.00 - 1.17	0.047	1.16	0.998 - 1.36	0.059
Years since DM diagnosis	1.01	0.99 - 1.04	0.31	1.01	0.96 - 1.06	0.72
COPD	0.77	0.54 - 1.12	0.16	0.48	0.26 - 0.93	0.02
Prescribing physician Specialty (other than diabetes)	1.15	0.87 - 1.53	0.33	1.15	0.67 - 2.04	0.61
Geographic region (reference: central)						
Jerusalem	1.02	0.66 - 1.56	0.93	0.85	0.35 - 1.94	0.71
Northern	1.13	0.75 - 1.72	0.55	0.90	0.39 - 1.98	0.80
Southern	1.05	0.70 - 1.57	0.81	1.24	0.52 - 2.91	0.62

Table 1: Logistic regression for predicting GLP1-A prescription fulfillment at 7 and 30 days post approval. Automated PA was found to be the strongest predictor for prescription's filling. COPD = chronic obstructive pulmonary disease, DM = diabetes mellitus, GLP1-A = Glucagon-like Peptide-1 analogs, PA= prior authorization.

SGLT2i prescription fulfillment predictors	within one week			within one month		
	OR	95% CI	p-value	OR	95% CI	p-value
PA type (automated vs. manual)	1.53	1.09 – 2.14	0.01	1.03	0.54 – 1.98	0.92
Advanced age	1.02	1.00 – 1.04	0.09	1.03	0.99 - 1.08	0.10
Male gender	1.28	0.84 - 1.93	0.24	0.61	0.20 – 1.51	0.33
Socioeconomic status	1.07	0.97 - 1.19	0.17	1.16	0.95 – 1.41	0.15
Years since DM diagnosis	1.01	0.99 - 1.04	0.31	1.00	0.95 – 1.06	0.99
History of CVA	0.57	0.38 – 0.88	0.01	0.56	0.27 – 1.27	0.14
eGFR	0.99	0.98 – 1.01	0.14	0.99	0.96 – 1.01	0.30
Prescribing physician Specialty (other than diabetes)	1.48	1.04 – 2.10	0.03	1.44	0.74 - 2.96	0.30
Geographic region (reference: central)						
Jerusalem	0.70	0.37 – 1.16	0.15	1.48	0.46 – 5.24	0.52
Northern	1.01	0.59 - 1.70	0.98	1.32	0.48 – 3.53	0.58
Southern	0.71	0.44 - 1.14	0.15	0.70	0.28 – 1.65	0.42

Table 2: Logistic regression for predicting SGLT2i prescription fulfillment at 7 and 30 days post approval. Prescribing physician's specialty was found to be the strongest predictor for prescription's filling within 7 days, followed by automated PA. CVA = cerebrovascular accident, DM = diabetes mellitus, eGFR = estimated glomerular filtration rate, PA= prior authorization, SGLT2i = Sodium-Glucose co-transporter 2 inhibitors

Conclusions:

The automated PA system improved access time to SGLT2i and GLP1-A seven days post approval compared to the manual PA, while significantly reducing workload and economic burden of manual PA center. Future studies should address and explore other potential benefits including physicians and patients' satisfaction and the potential to alleviate the growing overload on human-based PA centers by the annual Israeli health basket's expansion.

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