Assessing the Impact of a Pharmacy-Based Therapy Management Program on Adherence and Healthcare Utilization in Cystic Fibrosis

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Background

- Prior research has shown that cystic fibrosis (CF) patients with low or moderate adherence to pulmonary medications are more likely to have higher rates of hospitalizations and higher healthcare costs.[1]

- Pharmacy-based comprehensive therapy management interventions have been developed in CF, and research is needed to better understand the impact of such interventions on adherence.

- In May 2014, Walgreens implemented the Connected Care® Cystic Fibrosis (CC-CF) clinical patient management program aimed at improving medication adherence.
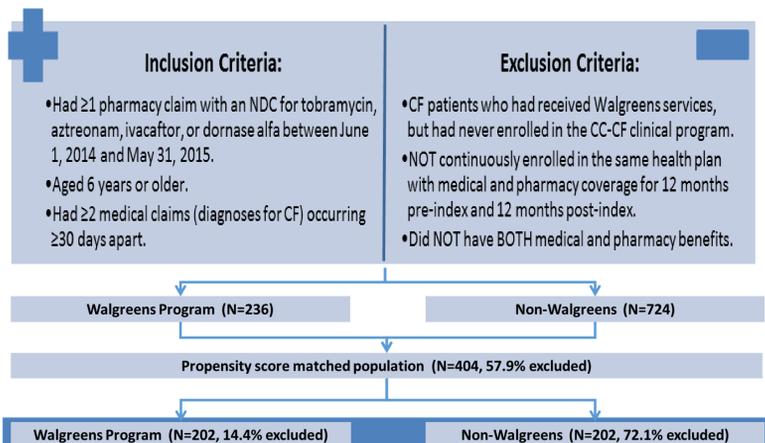
Objective

- To compare medication adherence, pulmonary exacerbations, healthcare utilization, and costs for patients with CF who utilized a comprehensive therapy management program to matched control group.

Methods

- *Study design:* Retrospective, observational cohort study.

- *Data sources:* De-identified claims and clinical data from (a) Inovalon's MORE[2] claims Registry® and (b) Walgreens pharmacy claims and clinical program data.

- *Study population:* Figure 1 lists criteria used to select the study sample. Each patient was followed for 1-year after the first fill (index date) for a CF medication within the study period.
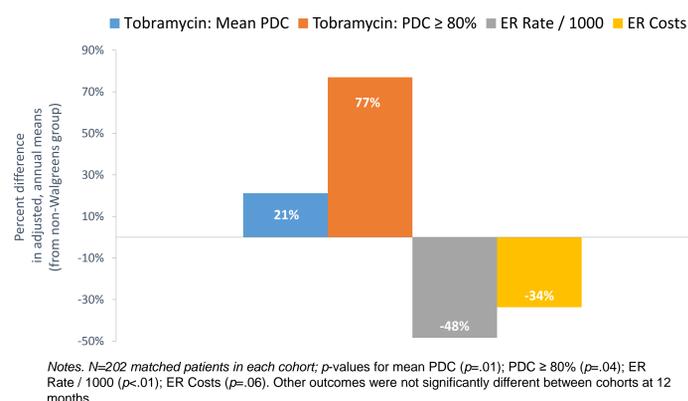
Figure 1. Study population

Inclusion Criteria:
- Had ≥1 pharmacy claim with an NDC for tobramycin, aztreonam, ivacaftor, or dornase alfa between June 1, 2014 and May 31, 2015.
- Aged 6 years or older.
- Had ≥2 medical claims (diagnoses for CF) occurring ≥30 days apart.

Exclusion Criteria:
- CF patients who had received Walgreens services, but had never enrolled in the CC-CF clinical program.
- NOT continuously enrolled in the same health plan with medical and pharmacy coverage for 12 months pre-index and 12 months post-index.
- Did NOT have BOTH medical and pharmacy benefits.

Walgreens Program (N=236) — Non-Walgreens (N=724)

Propensity score matched population (N=404, 57.9% excluded)

Walgreens Program (N=202, 14.4% excluded) — Non-Walgreens (N=202, 72.1% excluded)

Methods (continued)

- *Dependent variables:* 12-month medication adherence [i.e., proportion of days covered (PDC)], healthcare utilization (e.g., hospitalizations), clinical outcomes (e.g., pulmonary exacerbations), and total medical and pharmacy costs.

- *Propensity variables:* Baseline age, gender, calendar quarter of first CF fill in study period, payer type, census region, previous history of hospitalizations, comorbid diabetes, depression or anxiety, Charlson Comorbidity Index (CCI), and post-index utilization of aztreonam or ivacaftor in evaluation period (to account for cost variations).

- *Statistical methods:* Greedy 1:1 propensity score matching was used to compare Walgreens to non-Walgreens groups. Variables that remained significantly different between groups after matching were included in post-match generalized linear and logistic regression models.

Results

- The combined dataset contained 236 intervention patients and 724 control patients meeting selection criteria, of which 202 were propensity-matched from each cohort (see Figure 1).

- *Key findings:* As shown in Figure 2, Walgreens patients were significantly more adherent to tobramycin ($p<.05$), had lower ER rates ($p<.01$), and had lower ER costs ($p=.06$).

Figure 2. Relative Differences in Significant Outcomes

■ Tobramycin: Mean PDC ■ Tobramycin: PDC ≥ 80% ■ ER Rate / 1000 ■ ER Costs

Notes. N=202 matched patients in each cohort; p-values for mean PDC ($p=.01$); PDC ≥ 80% ($p=.04$); ER Rate / 1000 ($p<.01$); ER Costs ($p=.06$). Other outcomes were not significantly different between cohorts at 12 months.

- *Adherence:* Relative to the control cohort, program patients had 21% higher mean PDC for tobramycin (Incidence Rate Ratio, *IRR*=1.23; 95% CI [1.05, 1.43]; $p=.01$). Program patients were twice as likely to have a tobramycin PDC of 80% or higher than matched controls (Odds Ratio, *OR*=2.14; 95% CI [1.02, 4.49]; $p=.04$).

Results (Continued)

- *Utilization:* The ER utilization indicated that Walgreens patients had fewer ER visits than the control group of non-Walgreens patients (*IRR*=0.52; 95% CI [0.34, 0.78]; $p<.01$).

- *Costs*: Annual ER costs presented 34% lower for Walgreens patients compared to controls at a marginal significant difference (*IRR*=0.66; 95% CI [0.43,1.02]; $p=.06$).

Table 1. Adjusted Annual Means for Adherence and Utilization Outcomes

Annual Outcome	Walgreens		Non-Walgreens		p-value	
	Mean	≥80%	Mean	≥80%	Mean	≥80%
PDC - tobramycin	63%	33%	52%	18%	.01	.04
PDC - aztreonam	59%	25%	63%	36%	.39	.14
PDC – dornase	58%	28%	57%	27%	.84	.92
ER Visit /1000	755		1,462		<.01	
Hospitalization /1000	530		676		.15	
Outpatient Visits /1000	11,186		12,419		.20	

Notes. Number of program and control patients in adherence calculations varied by drug (tobramycin: 83/76; aztreonam: 87/69; dornase alfa:167/151). Ivacaftor results not shown due to small sample in study period (17/16).

Other outcomes were not significantly different between cohorts at 12 months but several trended positively. Compared to controls, the program group:

- Had lower proportion of patients hospitalized and treated with IV antibiotics (proxy for pulmonary exacerbations) (17% vs 21%; $p=0.19$).

- Had significantly lower annual hospitalization rate per 1000 in earlier results, but not in re-matched results (530 vs. 676; $p=0.15$).

Conclusions

- A pharmacy-based therapy management program for CF patients was associated with higher adherence to inhaled tobramycin and lower ER rates.

- Limitations of the study included a small sample size, reliance on administrative claims (no clinical data), and high variance for economic outcomes.

- Future studies should examine what components of such programs are most effective to improve adherence and related outcomes.

References

1. Quittner, AL, et al. Pulmonary Medication Adherence and Health-care Use in Cystic Fibrosis. Chest. 2014;146(1):142-151.