Assessment of Patient Interaction With a Dry Powder Inhaler Electronic Medication Monitor and Integrated System Within the Chronic Obstructive Pulmonary Disease Foundation Patient Powered Research Network

Poster No. P1481

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Introduction

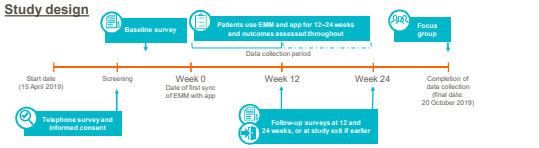
- Electronic medication monitors (EMMs) and companion smartphone applications (apps) remotely monitor patient inhaler use, provide reminders of next dose, record time and place of rescue inhaler use, and provide symptom-relevant factors (e.g. air quality) and evidence-based education.
- In asthma, EMMs have been associated with increased medication adherence, and decreased rescue therapy use and symptom burden;[1–4] however, few studies have included patients with chronic obstructive pulmonary disease (COPD) or assessed use of EMMs with dry powder inhaler (DPI) delivered medicines.
- The aim of this study was to evaluate daily frequency and duration of use of a digital platform for COPD self-management (EMM and associated app) among people with COPD, and to assess potential impact of EMM use on DPI adherence rates, rescue inhaler usage, and symptom control (assessed by COPD Assessment Test [CAT]). We also aimed to assess platform user satisfaction.

Methods

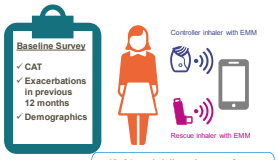
- This open-label, single-arm, prospective observational cohort study recruited patients from the COPD Foundation's Patient-Powered Research Network between April and July 2019.

Key inclusion criteria	Key exclusion criteria
• ≥40 years of age • Self-reported diagnosis of COPD • Self-reported treatment with a medication delivered by a DPI • User of mobile app compatible smartphone	• Active participation in any clinical study associated with COPD • Reported off-label DPI use

Study design



- After informed consent, patients received a controller inhaler EMM and rescue inhaler EMM (if requested) by mail.
- Baseline characteristics were collected via survey and used to determine Global Initiative for Chronic Obstructive Lung Disease stage.
- DPI maintenance treatment adherence was quantified as the number of days therapy was used as prescribed (one actuation/day); rescue medication use was quantified by the number of puffs among patients with a rescue inhaler EMM.



12–24 week daily active use of app =
number of days with ≥1 instance of opening the app / number of days the patient was enrolled in the study

Results

- Overall, 122 patients enrolled in the study (**Table 1**).

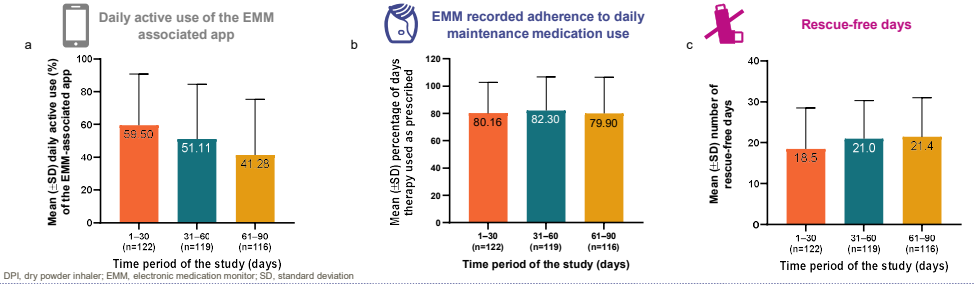
Table 1. Patient baseline characteristics

Characteristic	Patient population (N=122)
Age, years	
Mean (±SD)	65.2 (8.6)
40–49, n (%)	5 (4.1)
50–64, n (%)	52 (42.6)
≥65, n (%)	65 (53.3)
Gender, n (%)	
Female	78 (63.9)
Race, n (%)	
White	118 (96.7)
BMI, kg/m²	
Mean (±SD)	27.7 (7.1)
GOLD classification, n (%)	
A	5 (4.1)
B	63 (51.6)
C	1 (0.8)
D	53 (43.4)
Smoking status, n (%)	
Never	6 (4.9)
Current	11 (9.0)
Former	105 (86.1)
Duration of COPD diagnosis, years	
Mean (±SD)	10.1 (8.1)
<1, n (%)	7 (5.7)
1–5, n (%)	37 (30.3)
>5, n (%)	78 (63.9)
Asthma	
n (%)	37 (30.3)

BMI, body mass index; COPD, chronic obstructive pulmonary disease; GOLD, Global Initiative for Chronic Obstructive Lung Disease; SD, standard deviation

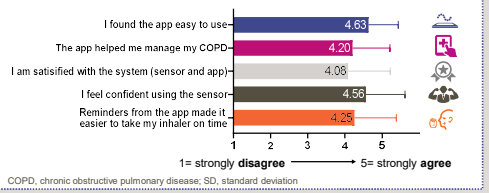
- The mean proportion of days patients interacted with the app decreased over time (**Figure 1a**).
- Mean DPI actuations (proportion of days) remained constant from days 1–30 through days 61–90 (**Figure 1b**).
- In patients with a rescue EMM, mean rescue-free days increased slightly over time (**Figure 1c**).
- No meaningful differences in CAT score were seen over the course of the study with a mean (SD) score of 19.42 (8.34) at 12 weeks and 20.19 (8.34) at study exit, and change from baseline of –1.29 (5.05) and –0.76 (5.28), respectively.
- Patients reported confidence in EMM use, value from app reminders, and satisfaction in the system (**Figure 2**).

Figure 1. EMM-linked app use (a), controller inhaler adherence (b), and rescue-free days (c) during the study period



DPI, dry powder inhaler; EMM, electronic medication monitor; SD, standard deviation

Figure 2. Participant exit survey scores (mean ±SD)



COPD, chronic obstructive pulmonary disease; SD, standard deviation

Conclusions

- Patients in a COPD cohort were confident using the EMM and satisfied with the EMM and associated app.
- Interaction with the app decreased over time, perhaps as patients became more familiar with the content and relied more on the reminders from the EMM.
- Patients had initial high EMM-confirmed adherence to maintenance DPI that persisted throughout the study, even as interaction with the app decreased.
- Among patients who requested an additional EMM for a metered-dose rescue inhaler, the number of rescue-free days increased over time.
- In this study, EMM use was associated with high patient satisfaction and frequent engagement with the app, which may remotely aid COPD management.

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Disclosures

- The authors declare the following real or perceived conflicts of interest during the last 3 years in relation to this presentation: GM, CBP, EM and RC have no conflicts to report; BPY has attended COPD advisory boards from GlaxoSmithKline, Boehringer Ingelheim, Sunovion and AstraZeneca; JL is a GlaxoSmithKline Patient Thought Leader Panel member, an AstraZeneca Patient Partnership Panel member, a Respira Labs Patient Advisor, a CSL Behring Consultant/Patient/Advisor, a COPD Foundation Wisconsin State Advocacy Captain, a member of the EFFORTS – Executive Board of Trustees, a Patient Co-Investigator Johns Hopkins School of Medicine Breathe2 Study, a University of Illinois/Chicago Research Associate, Board Member, a member of the US COPD Coalition, a NOSHNORA Respiratory Health Council Member, and a member of the Right2Breathe Board of Directors; DS is an employee of Propeller Health, which has received funding from GlaxoSmithKline plc.; RG and LK are employees of ResMed, the parent company of Propeller Health; KC and RT are employees of GlaxoSmithKline plc, and hold shares in GlaxoSmithKline plc.; DG and BW were Health Economics and Outcomes fellows with the University of North Carolina/GlaxoSmithKline plc. at the time this study was conducted; DS and RS were employees of GlaxoSmithKline plc. at the time this study was conducted, and hold shares in GlaxoSmithKline plc.

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