COPD maintenance therapy with tiotropium/olodaterol versus LABA/ICS: an assessment of the risk of treatment escalation and adverse outcomes in over 40,000 patients

A5072

Jennifer K. Quint,[1] Jukka Montonen,[2] Daina Esposito,[3] Xintong He,[3] Leslie Koerner,[3] Laura Wallace,[4] Alberto de la Hoz,[2] Marc Miravitlles[5]

[1]Population and Occupational Disease, National Heart and Lung Institute, Imperial College London, London, United Kingdom; [2]Boehringer Ingelheim International GmbH, Ingelheim am Rhein, Germany; [3]Department of Safety and Epidemiology, HealthCore, Inc, Wilmington, DE; [4]Boehringer Ingelheim Corporation, Ridgefield, CT; [5]Pneumology Department, Hospital Universitari Vall d'Hebron, Barcelona, Spain

Presentations supported by BI

INTERACTIVE

Quint et al. Comparative safety poster with audio summary

BACKGROUND

- COPD patients with high eosinophils and a history of more frequent exacerbations may benefit from treatment regimens that include ICS[1]
- However, maintenance treatments that include ICS are sometimes overprescribed, leading to an increased prevalence of pneumonia[2,3]
- Treatment with LAMA/LABA combinations, including T/O, have been shown to improve lung function versus LABA/ICS combinations[2,4]
- This non-interventional database study aimed to individually assess the risk of escalation to triple therapy (LAMA/LABA/ICS), exacerbation and pneumonia in COPD patients who initiated maintenance therapy with T/O versus any LABA/ICS combination
- The study also assessed the risk of an adverse outcome which was defined as any one of the events occurring (escalation to triple therapy or exacerbation or pneumonia)

METHODS & PATIENT CHARACTERISTICS

- Administrative healthcare claims and laboratory results data from the HealthCore Integrated Research Database℠ were evaluated for COPD patients initiating first treatment with T/O versus LABA/ICS during January 2013–March 2019
- Date of first prescription was defined as the index date
- Patients were followed until discontinuation or switch of their index treatment, the end of health plan enrollment, or 1 year after the index date

Inclusion criteria:
- Aged ≥40 years with a diagnosis of COPD (but not asthma) at cohort entry
- ≥1 year medical/pharmacy health plan eligibility prior to index date to allow identification of new users of T/O and LABA/ICS, and measurement of baseline covariates

Exclusion criteria:
- Patients on either T/O, LABA/ICS, or triple therapy for at least 1 year prior to the index date

- A Cox proportional hazard regression model was used to perform an as-treated analysis to assess risk of escalation to triple therapy, COPD exacerbation, pneumonia or an adverse outcome (i.e. one of the above)
- Potential imbalance of confounding factors between cohorts was handled using fine stratification and reweighting of the exposure propensity score (high-dimensional)
- Data were analyzed separately for subgroups based on circulating eosinophil levels (for those with available results) and exacerbation history

RESULTS

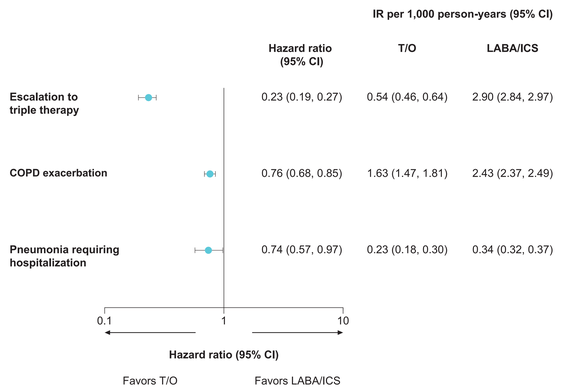
- After reweighting for stratified propensity scores, the total population consisted of 42,953 patients
- Patient baseline characteristics are shown in Table 1

Table 1. Baseline patient characteristics

Characteristics, n (%)	T/O[a] n=2,600	LABA/ICS[a] n=40,353
Female, n (%)	1,415 (54.4)	21,994 (54.5)
Mean age, years (SD)	65 (10.3)	65 (10.6)
Previous COPD treatments, n (%)		
LAMA monotherapy	587 (22.6)	9,079 (22.5)
LABA monotherapy	11 (0.4)	169 (0.4)
ICS monotherapy	126 (4.8)	1,950 (4.8)
LAMA/LABA	167 (6.4)	654 (1.6)
LAMA/ICS	18 (0.7)	281 (0.7)
Previous acute exacerbation history (any), n (%)		
0	1,701 (65.4)	26,321 (65.2)
1	534 (20.5)	8,334 (20.7)
≥2	365 (14.0)	5,697 (14.1)
Chronic comorbidity prior to index date		
CCI, mean (SD)	2.4 (1.8)	1.9 (1.8)
0	206 (7.9)	3,220 (8.0)
1–2	1,594 (61.3)	24,788 (61.4)
≥3	801 (30.8)	12,343 (30.6)
Subgroups, n (%)		
	n=347	n=4,102
Baseline eosinophils <300 cells/μL	248 (71.5)	3,053 (74.4)
Baseline eosinophils ≥300 cells/μL	99 (28.5)	1,049 (25.6)
	n=2,596	n=40,245
Infrequent exacerbation history[b]	2,027 (78.1)	28,476 (70.8)
Frequent exacerbation history[c]	569 (21.9)	11,769 (29.2)

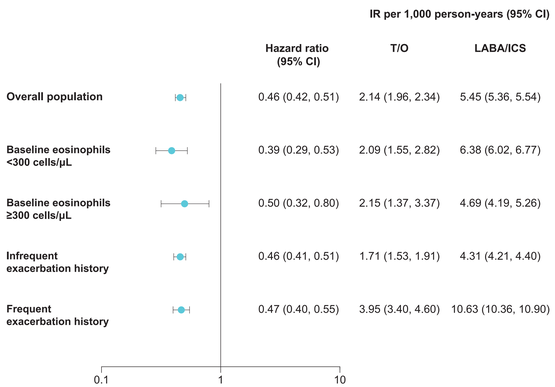
[a]Reweighted pseudo-population based on stratified exposure high-dimensional propensity score. Calculation of propensity scores and reweighting was repeated to create balance within each subgroup. [b]Infrequent exacerbation history was defined as 0 inpatient and 0–1 outpatient events in the preceding year. [c]Frequent exacerbation history was defined as ≥1 inpatient and/or ≥2 outpatient events in the preceding year.

Risk of escalation to triple therapy[a], COPD exacerbation[b] and pneumonia requiring hospitalization[c] with T/O versus LABA/ICS



[a]Escalation to triple therapy was defined as any record indicating FDC triple therapy or the addition of ICS to T/O, or a LAMA to LABA/ICS. [b]COPD exacerbation was defined as COPD-related hospitalization or emergency department visit for COPD, and/or prescription of an antibiotic on the same day as an oral corticosteroid. [c]Pneumonia was defined as hospitalization for community-acquired pneumonia.

Risk of an adverse outcome (escalation to triple therapy, or exacerbation, or pneumonia) with T/O versus LABA/ICS



Patients on T/O had a lower risk of escalation to triple therapy, COPD exacerbation and pneumonia versus patients on LABA/ICS

Patients on T/O were less likely to experience an adverse outcome versus patients on LABA/ICS

CONCLUSIONS

- Analysis of the 1-year follow up data shows that treatment with T/O results in a lower risk of escalation to triple therapy, COPD exacerbations, pneumonia and an adverse outcome versus LABA/ICS in COPD patients
- The reduction in the risk of an adverse outcome was similar irrespective of baseline eosinophils and exacerbation history

References

1. Global Initiative for Chronic Obstructive Lung Disease. Global strategy for the diagnosis, management, and prevention of chronic obstructive pulmonary disease (2020 report). 2019. Available here: https://goldcopd.org/wp-content/uploads/2019/11/GOLD-2020-REPORT-ver1.0wms.pdf;
2. Avdeev S, et al. Int J COPD 2019; 14:1267–1280;
3. Kew KM, Seniukovich A. Cochrane Database Syst Rev 2014; 3:CD010115;
4. Beeh KM, et al. Int J COPD 2016; 11:193–205.

Acknowledgments

This study was supported by Boehringer Ingelheim. Sarah Amir, PhD, at MediTech Media provided editorial assistance in the development of this poster, funded by Boehringer Ingelheim. The authors would like to thank all the patients for participating in these trials, and they also extend their thanks to the investigators.

Disclosures

JKQ's research group has received funds via Imperial Consultants. JM, LW and AdlH are employees of Boehringer Ingelheim. DE, XH and LK are employees of HealthCore Inc, which received funding from Boehringer Ingelheim to conduct the study. MM has received personal fees from Boehringer Ingelheim, Chiesi, GlaxoSmithKline, Menarini, AstraZeneca, Teva, Grifols, Novartis, Gebro Pharma, CSL Behring, Cipla, MedImmune, Mereo BioPharma and Sandoz.

Abbreviations

CCI, Charles Comorbidity Index; CI, confidence interval; FDC, fixed-dose combination; ICS, inhaled corticosteroid; IR, incidence rate; LABA, long-acting β_2-agonist; LAMA, long-acting muscarinic antagonist; SD, standard deviation; T/O, tiotropium/olodaterol.

Boehringer Ingelheim

Poster presented at the 2020 American Thoracic Society International Conference, Philadelphia.