Association between Treatment Steps, Patient Characteristics, and Health Outcomes amongst Asthma Patients in the United States

Chong H. Kim1, Piyameth Dilokthornsakul2, Matthew Strand3, Jonathan D. Campbell1

*1 Department of Clinical Pharmacy, University of Colorado Anschutz Medical Campus*

*2 Center of Pharmaceutical Outcomes Research, Department of Pharmacy Practice, Faculty of Pharmaceutical Sciences, Naresuan University, Phitsanulok, Thailand*

*3 Department of Biostatistics and Informatics, University of Colorado Anschutz Medical Campus*

**ABSTRACT:**

*Objectives*: Asthma management guidelines from American Thoracic Society (ATS) and Global Initiative for Asthma (GINA) suggests a stepwise therapeutic management strategy for asthma patients. This study aims to characterize the association between the various treatment steps and patient characteristics. Additionally, the association between asthma health outcomes with treatment step trajectories are assessed.

*Methods*: A retrospective cohort study between Jan. 2006 ~ Dec. 2013 using a random sample from IMS PharMetrics Plus claims database of asthma patients in the United States aged between 6 and 64 at index date. The primary outcome of interest are treatment step (ordinal) and asthma health events categorized as dichotomous and nominal variable. Data was modeled using a generalized linear mixed model (GzLMM) framework for both outcomes of interests. A priori selection of covariates of interest were age, gender, Charlson Comorbidity Index (CCI), region and insurance type.

*Results*: There was a statistically significant association between treatment steps and time since index date, baseline age, gender, and CCI (p<0.05) under a proportional odds model. The generalized logit model indicates that treatment step 1 subjects have an overall lower odds of asthma exacerbation event (i.e. 0.812 times lower odds of hospitalization compared to no event). Females compared to males had a higher asthma exacerbation event odds 1, 2, 3, and 4 (1.914, 1.133, 1.297, and 1.253) compared to no event. Patients with 1 unit increase in CCI value have a higher odds of event 1, 3, and 4 (1.157, 1.040, and 1.096 times greater odds) compared to no event.

*Conclusions*: The longitudinal analysis of asthma treatments steps identified many significant association between treatment steps and patient characteristics such as baseline age, CCI, and gender. Additionally, patients with higher CCI values and females (compared to males) had higher odds of exacerbation events.