Real-world treatment patterns of newly diagnosed asthma patients

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Abstract

We give insight in real-world treatment patterns of asthma patients to understand and address current gaps in care. Preliminary results on four databases show that treatment patterns vary across countries with substantial differences in initial and subsequent treatments.

Research Category (please highlight or circle which category best describes your research)

Clinical characterization, population-level estimation, patient-level prediction, other (if other, please indicate)

Background

Today, many guidelines are available that provide clinical recommendations on asthma care with as ultimate goal to improve outcomes of asthma patients[1-4]. There is a lack of knowledge how patients first diagnosed with asthma are treated in real-world. We give insight in treatment patterns of newly diagnosed asthma across countries to help understand and address current research gaps in clinical care by utilizing the powerful analytical tools developed by the Observational Health Data Sciences and Informatics (OHDSI) community.

Methods

The study was executed in four databases, one Electronic Health Record database from the Netherlands, i.e. Integrated Primary Care Information (IPCI) and three claims databases from the United States: IBM MarketScan® Commercial Database (CCAE), IBM MarketScan® Multi-State Medicaid Database (MDCD), and IBM MarketScan® Medicare Supplemental Database (MDCR).

We identified patients first diagnosed with asthma between 01/01/2011 and 31/12/2019. We included patients aged 18 or over at time of diagnosis, having at least 1 year prior and 3 year follow-up database observation time since diagnosis. Patients were excluded if they had a concomitant condition of chronic obstructive pulmonary disease (COPD) or emphysema, or a diagnosis related to chronic systemic corticosteroid use in their history. Treatment patterns were analyzed at class level (i.e. short acting B2 agonists (SABA), inhaled corticosteroids (ICS), long acting B2 agonists (LABA), etc.), for which we designed cohorts using the active ingredient and dose form of drugs in the OMOP-Common Data Model (CDM).

Our study design is similar to that of Hripcsak et al.[5] and Kern et al.[6]. We defined drug eras as continuous sequences of subscriptions from the same class with a maximum gap of 30 days between exposures. A prescription of another drug class is considered a switch if it has fewer than 30 days overlap with the previous drug class or a combination therapy otherwise. We visualized the results in sunburst plots using the software ATLAS (http://atlas-demo.ohdsi.org/#/pathways).

Results

We identified a total of 552,853 newly diagnosed asthma patients across the databases. The results are presented in Figure 1.

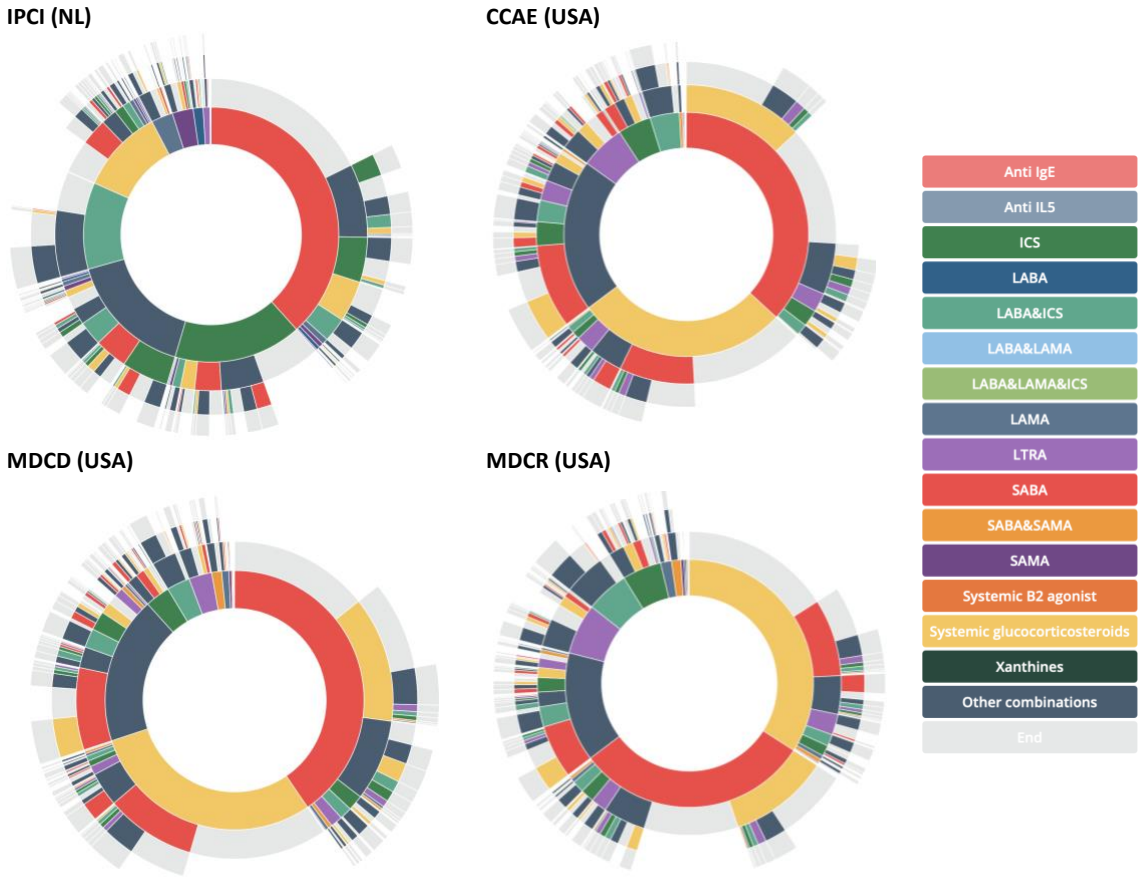

Figure 1. Sunburst plots of treatment patterns showing the first treatment in the center and subsequent treatments in the surrounding outer layers. Each color represents a drug class and a layer with multiple colors indicates a combination therapy. The grey color indicates that no follow-up treatment was taken.

The figures show that the most commonly prescribed drug classes are ICS, SABA and systemic glucocorticosteroids. We observe large differences in the initial treatment received by patients within and across databases. In IPCI, most patients first received a SABA, ICS or LABA/ICS combination. However, in the US databases (CCAE, MDCD, MDCR) systemic glucocorticosteroids are also frequently prescribed after a first diagnosis. In all databases, more than 20 percent of patients started with some form of combination treatment. The fragmented outer layers indicate that follow-up treatments also vary substantially between patients, but further research is necessary to analyze these differences in treatment pathways.

Conclusion

This is the first study to investigate treatment patterns of asthma patients on a large scale. Based on our results, we conclude that treatment patterns vary across countries with substantial differences in initial treatments. Approximately one-third of the prescriptions are in line with historic* guideline recommendations to start treatment with SABA. However, drugs associated with poorly controlled asthma (i.e. systemic glucocorticosteroids) are frequently used as initial treatment in the US databases. Furthermore, we note that quite some patients in IPCI directly start with a treatment recommended for moderate instead of mild asthma (i.e. LABA/ICS). Further research is necessary to analyze differences in follow-up treatments. In the near future, we plan to execute this study in more databases.

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* Since 2019 GINA no longer recommends treating adults and adolescents with asthma with SABA alone.