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Background: Asthma control can be defined in different ways. Genetic and phenotypic predictors of treatment response differ depending on the definition of the outcome chosen (for example lung function, exacerbations or symptom-free days).

Objectives: To investigate the association between current and long-term asthma control.

Methods: We included 418 children using inhaled corticosteroids (ICS) participating in the PACMAN-cohort. Current asthma control (last week) was defined using the Asthma Control Questionnaire (ACQ). Long-term asthma control (last year) was based on Global Initiative for Asthma (GINA) guidelines. This was analysed for the different seasons (spring, summer, autumn and winter) separately. Not well-controlled asthma was defined as: $\geq$3 of the following items present in a specific season: (1) day-time or (2) night-time symptoms, (3) limitations in activities and (4) rescue medication use. Secondly, this first definition was adjusted for the frequency of symptoms during a season. Children with frequent symptoms (daily/weekly symptoms during a season) were classified as not well-controlled, children with monthly symptoms were classified as partially controlled and children who experienced rarely symptoms were classified as well-controlled. When asthma control was present in $\geq$3 seasons we qualified this as long-term asthma control (asthma control during the past year). Current and long-term asthma control were compared in order to investigate agreement.

Results: Long-term uncontrolled asthma rates were highest in winter (51%) and lowest in summer (33%) ($P < 0.05$). 42% of the patients did not have long-term asthma control during the past year. Overall agreement between current and long-term asthma control was 67% and kappa statistics (≤ 0.39) indicated poor agreement.

Conclusions: The congruence between current and long-term asthma control is poor in our cohort of asthma children using ICS. There existed significant seasonal differences in asthma control. In observational studies assessing asthma control, it is therefore important to calculate long-term asthma control (instead of using current asthma control as indicator) or to stratify at least for seasonal variation.

147. Asthma Symptoms in Pediatric Patients: Differences throughout the Seasons

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Background: Seasonal variation in asthma has been widely recognized.

Objectives: To describe seasonal patterns of asthma symptoms and medication use in a cohort of pediatric asthma medication users and to study determinants of seasonal childhood asthma.

Methods: For this study, 602 children participating in the PACMAN (**P**harmacogenetics of **A**sthma medication in **C**hildren: **M**edication with **An**ti-inflammatory effects)-cohort were included. Parents were asked about their child's respiratory symptoms and rescue medication use over the past year. In addition, we defined asthma control per season based on the international GINA guidelines and performed regression analysis to study determinants of uncontrolled asthma.

Results: There was a decline in asthma symptoms and medication use during the summer period and a peak occurred from autumn to spring. The prevalence of wheeze ranged from 32% in summer to 56% in autumn. The prevalence of respiratory symptoms and medication use was significantly lower during summer ($p < 0.0001$). Oral steroid and antibiotic use and strong parental necessity beliefs were associated with uncontrolled asthma, regardless of seasonality. Allergic rhinitis was associated with an increased risk of uncontrolled asthma during spring (RR: 1.3 95%CI: 1.1–1.6) and summer (RR: 1.2 95%CI: 1.0–1.4). Eczema was associated with a higher risk of uncontrolled asthma during autumn (RR: 1.2 95%CI: 1.0–1.4) and winter (RR: 1.2 95%CI: 1.0–1.4).

Conclusions: We showed seasonal patterns in the prevalence of asthma symptoms and rescue medication use. We showed associations between allergic rhinitis and asthma during spring and summer and eczema during autumn. Seasonality in asthma morbidity and health care use is most likely associated with atopic constitution and viral infections, which are common during fall, winter and spring.

148. Prescribing Patterns of Combined Inhalers for Airway Disease Patients among Two Patient Populations in Taiwan

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Background: The combined inhalation therapies of long-acting β2 agonist and steroid are usually prescribed for long-term use among airway disease patients.

Objectives: To compare the drug use patterns of combined inhalers among two different patient populations in Taiwan.

Methods: The population-based analysis was conducted using the one million random samples of 2007 National Health Insurance databases (national group) and the 2009 claim data obtained from a 2000-bed medical center (local group) in Taiwan. The out-patient visits with prescription records of combined inhalers (salmeterol/fluticasone and

fometerol/budesonide) for corresponding airway diseases (ICD9 = 491,492,493,494,496) during one-year study period were evaluated. Their relevant data (i.e., visits' information, diseases), demographics and prescription trends among these two group populations were compared using *t* and *chi*-square tests.

Results: Fifty-six hundred patients (20,920 visits, 0.56% of total visits) in the national group and 2,495 patients (9,273 visits, 0.67% of total visits) in the local group were prescribed with the combined inhalers. Male was predominated in two groups (56.1% *vs* 57.7%). The national group were younger than the local group (48.2 ± 25.4 *vs.* 56.7 ± 22.1 year-old). More prescriptions were made by the pulmonary specialists in local group (83% *vs.* 64%). While 90.6% of the national group patients were prescribed with coded airway diseases, there were only 55.4% in the local group patients.54 and 51% of national and local groups, respectively, were prescribed with combined inhalers once or twice within one-year study period.

Conclusions: While only half patients being prescribed with combined inhalers for long-term regular use, the prescribing patterns among patients with airway diseases were different in national and local groups. Further periodically evaluation is necessary to ensure the quality of medical care and medication use.

149. Do Statins Improve Outcomes in Patients with Asthma on Inhaled Corticosteroid Therapy? A Retrospective Analysis of the Mississippi Medicaid Database 2002–2004

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Background: Animal model studies and clinical trials have looked at the potential benefits of the anti-inflammatory properties of statins in asthma management with contradictory results.

Objectives: To determine if asthma patients on concurrent statin therapy are less likely to have asthma-related hospitalizations and emergency room (ER) visits.

Methods: This is a retrospective cohort study using Medicaid data for 2002–2004. Asthma patients ≥18 years old were identified using the ICD9 code 493.xx, from Jul 1, 2002 through Dec 31, 2003. The index date for an exposed subject was any date within the identification period, 180 days prior to which the subject had at least 1 inhaled corticosteroid (ICS) prescription and at least an 80% adherence rate to statins. Medicaid beneficiaries identified as asthmatics and on ICS therapy, but not on statins were selected as the unexposed population. Each subject in the exposed group was matched to 2 subjects from the unexposed population using propensity scores computed using age, gender, race, urban/rural region and Charlson comorbidity index. The two groups were followed for 1 year beginning on the index date, and their outcomes in terms of hospitalizations and ER visits were compared using conditional logistic regression, further adjusted for adherence to ICS therapy, prior hospitalizations, ER, lab and office visits due to asthma.

Results: After matching, there were 479 exposed subjects with 958 corresponding controls. After adjusting for the above mentioned covariates, asthma patients not on concurrent statin therapy are almost two times as likely to have hospitalization and/or ER visits or both due to asthma (adjusted OR = 0.53; 95% CI [0.35, 0.81]; $p = 0.0032$), in comparison to patients on statin therapy. Similarly, they are also twice as likely to visit the ER due to asthma exacerbations as patients on statins (adjusted OR = 0.45; 95% CI [0.27, 0.77]; $p = 0.0035$).

Conclusions: The findings of this study suggest that there may be beneficial effects of statins in preventing asthma exacerbations. Further prospective investigations are required to provide conclusive evidence.

150. Influence of Depression on Chronic Obstructive Pulmonary Disease (COPD) Exacerbations among Medicare Beneficiaries with and without Disability

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Background: Both COPD and depression (DEP) are associated with significant morbidity and mortality. Comorbid DEP places COPD patients at heightened risk for COPD exacerbations. However, little is known about the influence of DEP on exacerbations for COPD patients with disabilities.

Objectives: To test the hypothesis that in disabled COPD patients, DEP is associated with greater rates of emergency department (ED) visits and hospitalizations (HOSP) than in COPD patients without disabilities.

Methods: Using 2006–2007 Medicare Chronic Condition Warehouse (CCW) database, we identified a retrospective cohort of COPD beneficiaries with Medicare A, B and D claims. We classified comorbid DEP by using ICD-9-CM diagnosis codes meeting CCW criteria in 2006. Disability was defined as having Social Security Disability Insurance (SSDI) as original reason for Medicare entitlement. Multivariable logistic regression models with a negative binomial distribution included interaction terms to test the effect modification of SSDI on the relationship between DEP and numbers of ED and HOSP event, controlling for demographics, comorbidities, and COPD severity.

Results: Among 74,863 beneficiaries with COPD, prevalence of DEP was 29.6%. DEP was present in 39.6% of SSDI and 24.5% of non-SSDI beneficiaries. Results from multivariable models showed that DEP was associated with