L39 Rates Of Corticosteroid And Antibiotic Prescriptions Are Significantly Increased With Omicron As Compared To Alpha And Delta Variants Of COVID-19 In Patients With Asthma

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RATIONALE: The novel Coronavirus-19 (COVID-19) pandemic remains ongoing and is complicated by the emergence of new variants. The impact of different variants on asthma is not known although early variants were not associated with increased disease burden in asthmatics. We compared healthcare burden in asthmatics among dominant COVID-19 variants during three time periods, comparing systemic corticosteroid and antibiotic prescriptions.

METHODS: Medical records of patients with PCR-confirmed diagnosis of COVID-19 were queried using a computer algorithm in three time periods (6/1/20-12/1/20, 7/1/21-12/1/21, 12/15/21-6/15/22), corresponding to the Alpha, Delta, and Omicron variants, respectively. Rates of systemic corticosteroids for asthma exacerbations and antibiotic prescriptions for respiratory infections (within 2 weeks prior and one month following diagnosis) were compared among the three time periods in asthmatics.

RESULTS: A total of 15,859 (Alpha), 19,221 (Delta), and 45,490 (Omicron) COVID-19 cases were identified. Of these, 1,168 (7.4%), 862 (4.5%), and 3,166 (7.0%) were asthmatics during Alpha, Delta, and Omicron variants, respectively. A total of 449/862 (52.1%), 684/1,168 (58.6%), and 2,338/3,166 (73.8%, $p<0.001$) asthmatics during the Alpha, Delta, and Omicron waves, respectively, received systemic corticosteroid prescriptions. Rates of antibiotic prescriptions were also higher for asthmatics during Omicron (1,778, [56.2%]) as compared to Alpha (595, [50.9%]) and Delta (454, [52.7%], $p= 0.005$).

CONCLUSIONS: In asthmatics, Omicron infection was associated with higher rates of corticosteroids for asthma exacerbations as well as antibiotic prescriptions as compared to Alpha and Delta waves. This study suggests the omicron variant is behaving more like a typical respiratory virus leading to increased disease burden in asthmatics.

L40 Heterogeneity of CD4+ T cell subsets in EoE drives inflammation and B cell help

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RATIONALE: Eosinophilic esophagitis (EoE) is a Type 2 cytokine-biased inflammation of the esophagus that is triggered by foods. Th2 cells and Tregs have been identified in the esophagus by flow cytometry and single cell RNAseq, however functional characteristics of T cells in EoE remain poorly understood.

METHODS: We examined T cell phenotype and response to milk in esophagus, duodenum and peripheral blood of EoE by spectral cytometry.

RESULTS: Two distinct subsets of Type 2 CD4+ T cells were found in esophagus, including a CD4+CD8-CRTH2+ population that decreased in number with resolution of eosinophilia and a CD4+CD8+CCR3+ population that was retained in number but decreased in cytokine production after resolution. Esophageal CD4+ T cells were constitutively activated in active EoE. Upon resolution, the resident CD4+CD8+ cells became highly responsive to milk stimulation. These milk-responsive T cells were not found in the duodenum of active or resolved EoE, highlighting the specific localization of these cells. Milk-responsive T cells could be found in the peripheral blood of active EoE, and included populations of Tfh cells. PBMCs from EoE was compared to IgE-mediated milk allergy (MA). Tfh cells from EoE were dominated by IL-10 production while Tfh cells from MA were dominated by IL-4/IL-13.

CONCLUSIONS: Our results point to two key CD4+ T cell populations in EoE, a resident CD4+CD8+ T cell population responsive to milk even after resolution of inflammation, and a systemic Tfh cell capable of driving IgG4 production.

L41 Patterns of switching are a measure of the real-world effectiveness of monoclonal antibody therapies in asthma

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RATIONALE: In patients with asthma, the switch from one biologic to another may reflect the lack of effectiveness of the initial biologic and may be a surrogate measure of effectiveness.

METHODS: We conducted a proof-of-concept study to evaluate switch patterns of omalizumab and mepolizumab as a measure of their real-world effectiveness. Using EHR data from a large health system in Boston, MA, we identified patients who initiated biologic therapy for asthma between March 2016 and August 2022. We excluded patients with alternate indications for therapy. Two physicians conducted chart reviews to identify the reasons for switching in those who switched. Thereafter, we matched patients who switched to those who did not switch on age, sex, BMI, comorbidities, race, insurance, smoking, IgE, eosinophil, and baseline exacerbation count. We compared the cumulative incidence of exacerbations between those who switched and those who did not switch.

RESULTS: Seven hundred and eleven patients initiated omalizumab and 173 patients initiated mepolizumab. During follow-up (median: 3.5 yrs), 27% of omalizumab patients and 45% of the mepolizumab patients switched at least once. Three-quarters of switches were due to suboptimal effectiveness. Individuals who switched from omalizumab had 2-4 times the hazard of matched controls who did not switch (hazard ratio, HR: switch for effectiveness, 3.81 (95% Confidence Interval, CI 1.72-8.42); all-cause switch: 1.98: 1.10-3.56). These conclusions were similar for mepolizumab: HR, switch for effectiveness, 2.39 (1.17-4.91); all-cause switch: 1.57 (0.87-2.83).

CONCLUSIONS: Real-world patterns of switching between biologics may be a proxy for effectiveness.