Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

197 T Cell Responses to SARS-CoV-2 Vaccination and Infection in Antibody Deficiency Diseases

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RATIONALE: Patients with antibody deficiency are highly vulnerable to SARS-CoV-2 infection. Current data is lacking on the efficacy of SARS-CoV-2 vaccination in patients with XLA and CVID. As T cell responses play an essential role in antiviral control, we hypothesized that antibody-deficient individuals can mount SARS-CoV-2-specific $CD4^+$and $CD8^+$ T cell responses to vaccination or infection.

METHODS: We recruited XLA and CVID patients (aged 2 months to 65 years) from the Primary Immune Deficiency Diseases Registry at 2 academic centers. Blood samples were collected prior to vaccination and at 7, 21, and 120 days post vaccination with the Pfizer/BioNTech or Moderna mRNA vaccines. Samples were also collected from patients with a history of COVID-19. Spike (S) protein-specific T cell responses were measured after stimulation with peptide pools of S proteins from the Wuhan strain, or alpha, beta, and delta variants by intracellular cytokine staining using flow cytometry.

RESULTS: Out of 3 XLA and 3 CVID patients, 2 patients from each group showed post-vaccine responses. All vaccinated patients had detectable specific $CD4^+$ and $CD8^+$ T cell responses between day 7 and 21 to both the Wuhan and variant strains. Among 2 XLA and 2 CVID patients who had COVID-19, the 2 XLA patients developed $CD4^+$, but no $CD8^+$ T cell responses, whereas the CVID patients had greater $CD8^+$ T cell responses.

CONCLUSIONS: Despite antibody deficiency, our preliminary data suggest that XLA and CVID patients may benefit from SARS-CoV-2 vaccination by generating specific T cell immunity with the potential to limit disease severity.

198 Development of a Mobile Naturalistic Exposure Chamber for Cat Dander

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RATIONALE: Cat allergen exposure chambers support clinical research through controlled exposure. Permanent chambers with live cats (e.g., the RMT Naturalistic Exposure Chamber) exist, but expansion to multi-site clinical trials is inhibited by the expense of operating brick-and-mortar facilities with animals. We have developed a portable model for controlled exposure to natural cat allergen to facilitate multi-site clinical trials.

METHODS: The NEC Mini-Home consists of a tent (which can fit in standard indoor spaces), a carpet, a chair, and a side table. A modified robot vacuum, with variable exhaust flow, aerosolizes allergen from milled cat hair on the carpet and in a custom, vibration-agitated canister mounted onto the vacuum's exhaust. Airflow passing through the canister ejects allergen-laden air, while large debris is filtered. Allergen levels are controlled by varying exhaust flow rate and the cat hair on the carpet. Air samples were assayed for Fel d 1 by ELISA.

RESULTS: The combination of allergen reservoirs (cat hair from the carpet and allergen canister) resulted in stable, repeatable allergen levels. Time-averaged Fel d 1 air concentration in four replicate two-hour tests was 100 ± 24.5 ng/m^3 (mean$\pm$SD), with an average intra-test coefficient of variation (temporal) of 34%. A range of Fel d 1 (measured for one hour) of 34.6 ± 6.9 ng/m^3 to 217 ± 73.1 ng/m^3 was achieved by varying the carpet hair amount from 0 g to 5 g.

CONCLUSIONS: The mobile model provides controlled cat allergen exposure while facilitating expansion into multi-site clinical trials. Further development may focus on patient validation and extending this model to other aeroallergens.

199 Coding For Indoor Environmental Exposures In Pediatric Patients With Respiratory Allergies: A Quality Improvement Project

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RATIONALE: Allergic asthma and rhinitis are among the most common chronic childhood illnesses. In sensitized patients, exposure control can be a valuable tool in preventing disease progression or exacerbation (Portnoy et al, *Ann Allergy Asthma Immunol* 108 (2012) 223.e3), and inquiring about patients' aeroallergen exposures is therefore vital. This project investigated whether providers at the Children's Healthcare of Atlanta allergy practice were determining what indoor aeroallergens/irritants their patients with allergic asthma and/or rhinitis were exposed to.

METHODS: A retrospective chart analysis of 206 pediatric patients with physician-diagnosed persistent allergic asthma or rhinitis was undertaken to determine if physicians were inquiring about exposure(s) to dust mite, cockroach, animal dander, mold, and/or secondhand smoke (SHS). Measures studied were documentation of indoor aeroallergen exposure and documentation addressing secondhand smoke exposure in new pediatric patients with diagnoses of allergic rhinitis or allergic asthma. Multiple strategies were employed to develop clinic-specific processes over 4 PDSA cycles (1 week/plan-do-study-act cycles).

RESULTS: Documentation of indoor aeroallergen exposure noted 57.5% mean compliance pre-intervention. Following 4 separate interventions, including weekly emails to providers, signs in the clinic workroom, implementation of specific smart text, and staff reminders, compliance improved to a mean of 87.5%. Pre-intervention SHS documentation mean compliance was 48.75% but improved to 70% post-intervention.

CONCLUSIONS: Initial documentation of aeroallergen/irritant exposure was seen in <60% of patients, demonstrating a clear need for screening interventions early in the workflow. This quality improvement project improved documentation of said exposures and will help sensitized patients through targeted risk assessment, counseling, and environmental mitigations.