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# Research Abstracts

## Adverse Drug Reactions, Insect Reactions, Anaphylaxis

## P001

### ALLERGISTS LEAD ANAPHYLAXIS PREPAREDNESS VIRTUAL WORKSHOPS FOR EARLY CHILDHOOD PROFESSIONALS AMIDST THE COVID-19 PANDEMIC

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**Introduction:** The early childhood population has high rates of food allergy. This same population often attends early childhood education programs (e.g. daycare, preschool). Unfortunately, many programs lack adequate training to prepare staff to confidently recognize and respond to anaphylaxis. We have previously provided in-person workshops; however, the COVID-19 pandemic prompted a pivot to live, online workshops for early childhood professionals (ECPs).
**Methods:** We adapted our previously in-person, case-based anaphylaxis and epinephrine auto-injector training workshops to virtual workshops. Eight workshops were conducted between September 2020 and June 2021 via Zoom by board-certified allergists in collaboration with a local health department. Some workshops included interpreters to present the material in multiple languages. After each workshop, ECPs were sent a 17-question post-workshop electronic questionnaire via QuestionPro. Questions were multiple choice, true/false, Likert scales, and free text.
**Results:** 430 ECPs attended the workshops, and 241 completed the post-workshop questionnaire: 97.5% reported satisfaction with the workshop, 91.7% found the demonstration of epinephrine auto-injectors important, and 97.9% and 94.6% reported confidence in their ability to recognize anaphylaxis and properly administer epinephrine, respectively. Reported anxiety related to caring for children with food allergy diminished by approximately 50% after completing the workshop.
**Conclusion:** Allergist-led virtual workshops allowed for continued anaphylaxis-preparedness training for ECPs amidst the COVID-19 pandemic. The virtual workshops were accessible to a wider ECP audience compared to previously offered in-person workshops and, like in-person workshops, improved confidence in correctly identifying and responding to anaphylaxis.

## P002

### CLINICAL OUTCOMES OF BACTERIAL PNEUMONIA IN PENICILLIN ALLERGIC PATIENTS

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**Introduction:** Penicillins (PCNs) are first-line therapy for pneumonia treatment. PCN allergy label, the most prevalent antibiotic allergy label, can result in the use of alternative antibiotics risking poorer response to treatment and potentially increased side effects. We investigated the clinical outcomes of pneumonia in patients with PCN allergy.
**Methods:** We utilized TriNetX, a global research database, to identify adult patients with non-viral pneumonia. We categorized these patients into those with and without PCN allergy label before pneumonia diagnosis. The two cohorts were propensity score matched for age, sex, race, and underlying chronic medical conditions. The 30-day risk of hospitalization, acute respiratory failure, need for an intensive level of care, and mortality following the pneumonia diagnosis were contrasted between the two cohorts.
**Results:** We identified 68,768 adult patients with PCN allergy label who had pneumonia and 1,482,272 pneumonia patients without prior PCN allergy label. After propensity score matching, 68,748 patients were included in each cohort. PCN allergic patients with pneumonia had increased risk of hospitalization (RR, 1.23; 95% CI, 1.22-1.24; $P<0.001$), and slightly increased risks of acute respiratory failure (RR, 1.14; 95% CI, 1.12-1.15; $P<0.001$), need for intensive level of care (RR, 1.11; 95% CI, 1.08-1.14; $P<0.001$) and mortality (RR, 1.08; 95% CI, 1.04-1.13; $P<0.001$) compared to patients without PCN allergy.
**Conclusion:** Adult patients with PCN allergy label diagnosed with pneumonia may have a greater 30-day risk of worse outcomes including hospitalization, acute respiratory failure, need for an intensive level of care, and mortality compared to patients without PCN allergy.

## P003

### DIAGNOSTIC UTILITY OF PEG/POLYSORBATE 80 SKIN TESTING AND ORAL CHALLENGE FOR COVID-19 MRNA VACCINE ALLERGY

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**Introduction:** Polyethylene glycol (PEG) can cause IgE-mediated reactions to COVID-19 mRNA vaccines. Expert guidance recommends PEG/polysorbate-80 skin testing (ST). The utility of PEG oral challenge to confirm/disconfirm tolerance of COVID-19 vaccine allergy has not been established.
**Methods:** This is a retrospective chart review of adult patients undergoing PEG/polysorbate-80 ST, with/without PEG oral challenge. Diagnostic ST and oral challenge protocols were adapted from Banerji,et al. *JACI Pract* April 2021.
**Results:** From January-June 2021, 63 patients underwent PEG/polysorbate-80 ST. Twenty-five reported adverse reaction, 92% immediate, to the first COVID-19 vaccine; 38 were evaluated pre-vaccination based on concerns related to mast cell disorder or adverse reactions to vaccines, multiple medications, and/or PEG/polysorbate. Seven of 63 (11%) had positive ST to PEG (n=6) or polysorbate-80 (n=1). Fifty-seven of 63 (90.5%), 2 with positive ST, underwent PEG oral challenge. Eleven of 57 (12%) experienced immediate reactions (6 received antihistamines only; 1 required epinephrine). Three patients underwent double-blind, placebo-controlled (DBPC) PEG oral challenge without reaction; 2 tolerated COVID-19 vaccination. Five of 11 (46%) experiencing symptoms

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during oral challenge underwent COVID-19 vaccination (1 reported mild cutaneous symptoms); 6 avoided vaccination. Both positive ST patients experienced immediate symptoms to PEG oral challenge (1 required epinephrine) and were advised to avoid vaccination. Of 46 with negative PEG oral challenge, 30 (65%) were vaccinated with only 2 having mild reaction.

**Conclusions:** Diagnostic ST and PEG oral challenge, and DBPC challenge in selected cases, can provide useful guidance for patient and allergist in the shared decision-making process of receiving COVID-19 vaccination.

## P004

### EPIDEMIOLOGY AND ETIOLOGY OF ANAPHYLAXIS IN A CHILDREN'S HOSPITAL EMERGENCY DEPARTMENT FROM 2010-2020

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**Introduction:** ED visits for anaphylaxis have risen significantly in the last 20 years. Knowledge of predisposing factors can lead to risk reduction, earlier identification, and improved care.

**Methods:** A retrospective chart review of pediatric ED patients at a tertiary Children's Hospital (2010-2020), selected by 28 ICD-9/ICD-10 codes for anaphylaxis/allergic reactions and verified using NIH criteria. Severity was determined using a recent consensus-based anaphylaxis severity-grading-system. Statistics completed with SPSS.26.

**Results:** 1023 charts were reviewed, 229 met NIH criteria for anaphylaxis. Mean age was 6.6 (0.25-20 years), 56% male, 51% White, 45% were Black. 30.6 % of episodes were in children $\leq$ 2, 19% (3-5 years), 23.6% (6-10 years) and 19.5% (11-15 years) and 7.3% (>15 years). 91% had no history of previous anaphylaxis, though 48% had previous diagnosis of allergy (peanut (PN) =18%, tree nuts (TN) =15%, milk=18%, egg=13%, PCN=6%). Based on severity scale, 93% of episodes were mild, grade 2 or 3 (0-5) at presentation with no significant M/F or racial differences in severity (p=0.41; p=0.45). Highest severity scores were in 6-15 yo compared to children < 12 months (p= 0.006). Anaphylaxis causes included: 64% food-induced (25% PN /21% TN), drugs (12%), unknown (19%), insect stings (1%). Children over 15 had higher association with drug-induced anaphylaxis (p<0.001).

**Conclusion:** Older children have more severe anaphylaxis. PN/TN are most frequent causes of anaphylaxis. Almost 1/3 of cases were kids $\leq$ 2 years old. 90% of episodes had no previous history suggesting anaphylaxis occurs in younger children and is more challenging to predict.

## P005

### EXAMINING HYPERSENSITIVITY REACTIONS TO PLATINUM-BASED CHEMOTHERAPEUTIC AGENTS AND OUTCOMES TO DESENSITIZATION PROCEDURES

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**Introduction:** Hypersensitivity reactions (HSRs) to platinum-based chemotherapy pose treatment challenges. Classification of platinum HSRs is not well described in existing literature and may be used to predict desensitization outcomes. We aim to characterize platinum HSRs using a published classification system and examine desensitization outcomes.[1]

**Methods:** A single-center retrospective cohort study was conducted of adult patients with solid tumor malignancies undergoing inpatient desensitization for platinum-based HSRs from 2016 −2021. Patient demographics, chemotherapy histories, and desensitization outcomes were collected. HSRs were classified as mild, moderate (low-risk), moderate (high-risk), or severe using a published classification system.[1] Descriptive statistics were performed.

**Results:** Ten patients were included in the study with over two-thirds female and 80% self-identified as Latinx or Black/African American. Patients received a mean of 6 platinum doses prior to initial HSR. Reactions were classified as mild (30%), moderate (low-risk; 40%) and severe (30%). The most common symptoms were flushing and pruritus (70%). Among patients with severe HSRs, symptoms included flushing (100%), tachycardia (67%), and hypoxia (67%). Mean number of desensitization courses was 6.6 ($\pm$ 8.8) per patient. Two patients had desensitization reactions, both of whom had a severe initial HSR. These reactions were classified as mild (n = 1) and severe (n = 1).

**Conclusion:** Most HSRs to platinum agents were classified as mild/moderate (low-risk), and desensitization was well tolerated. Desensitization reactions occurred only in those with severe initial HSRs. Classifying patients by severity of initial HSR may help to predict desensitization outcomes. Further research is needed to determine the optimal setting for platinum desensitization.

**Figure.** SD = standard deviation

## P006

### POLYETHYLENE GLYCOL ALLERGY LABEL: NOT AN ABSOLUTE CONTRAINDICATION TO RECEIVING AN MRNA COVID-19 VACCINE

M. Pitlick*, K. Dages, A. Joshi, M. Park, *Rochester, MN*

**Introduction:** Individuals are often asked if they have a polyethylene glycol (PEG) allergy prior to receiving an mRNA COVID-19 vaccine. An affirmative answer may delay vaccination, which may not always be necessary.

**Methods:** A retrospective chart review of patients with PEG on their allergy list who presented to a COVID-19 vaccination clinic was performed with emphasis on demographic characteristics, atopic comorbidities, PEG allergy details, and outcome of vaccination.

**Results:** Data were available for 100 patients with listed PEG allergy who received a COVID-19 vaccine. Gastrointestinal intolerance was the most reported PEG reaction (n=38) followed by cutaneous symptoms (n=29) and a variety of other non-allergic symptoms (n=28). Oral PEG preparations accounted for most reported PEG allergies (n=84). 64 patients received the Pfizer vaccine, 33 received the Moderna vaccine, and 3 received the Janssen vaccine. All 100 patients tolerated their full vaccine series without allergic symptoms.

**Conclusions:** This review demonstrates that patients with a prior adverse reaction to PEG containing products can tolerate mRNA COVID-19 vaccines. Our cohort primarily consisted of patients who experienced gastrointestinal intolerance with oral PEG preparation. This is unlikely to represent a true PEG allergy and should not delay vaccination. Given PEG's potential role as a culprit in mRNA COVID-19 vaccine reactions, it is still important to assess for PEG allergy prior to vaccination, but it is important to recognize non-allergic reactions. If there is any question, use of a non-PEG containing vaccine (Janssen) or rapid e-consultation with an allergist may be appropriate to facilitate timely vaccination.

## P007

### TRAIN-THE-TRAINER PROGRAM EFFECTIVELY PROVIDES ALLERGY EDUCATION TO FIRST RESPONDERS AND EXPANDS THE REACH OF ALLERGISTS

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**Introduction:** As the incidence of anaphylaxis increases, communities need to know how to recognize and respond to allergy emergencies. Allergists can play an impactful role in allergy preparedness by teaching first responders how they can teach schools about anaphylaxis.

**Methods:** Board-certified allergists adopted a train-the-trainer approach to instruct first responders on teaching food allergy-focused anaphylaxis and epinephrine classes. Instructor training initially occurred in-person. Due to COVID and scalability, training was converted to a hybrid training (primarily asynchronous, online course with live, synchronous components required) and expanded