The Risk of Failed Oral Food Challenges Raised by Asthma and Multiple Allergies

Researchers conducted a retrospective study to identify allergy risks (primarily from cow's milk and hen's egg) associated with oral food challenges (OFCs). The study specifically analysed outcomes from 205 OFCs in children, and found an overall failure rate of 32.2%, albeit most reactions were categorized as 'mild'.

The study identified two significant risk factors for a failed challenge: having a diagnosis of asthma and having multiple food allergies (multi-food allergy). Additionally, the coexistence of asthma or multi-food allergy with a history of anaphylaxis further increased the likelihood of failed OFC.

These findings highlight the safety of OFCs in a controlled setting and the importance of careful patient selection to manage and mitigate reaction risk, particularly in children, given their developing immune responses.

Study

The present study aims to aid future paediatric efforts by leveraging a retrospective analysis to identify children's preexisting allergies that may be associated with increased OFC-induced allergy risk. The study reviewed the medical charts of all pediatric patients who underwent a standard-of-care OFC from 2014 onward at a single-centre "Pediatric Allergy Department".

Data of interest consisted of foods commonly used in OFCs, alongside participants' routine medical (preexisting history of allergic comorbidities) and sociodemographic (age, sex) histories. Summary statistics revealed that cow's milk protein (CMP) and hen's eggs were the most tested foods, accounting for 50.2% and 41.0% of challenges, respectively.

Statistical analyses were managed using the Pandas-Python Data Analysis Library (vs. 3.12). They included the Pearson chi-square test, the Mann–Whitney U test, Spearman's rank correlation, and logistic regression models. Finally, Youden's index (J) was used to compute outcomes' sensitivity and specificity.

Results

The present study reveals that, when performed in a controlled hospital setting, OFCs are a relatively safe and effective tool, only failing (triggering allergic reactions) in 32.2% of cases. Most importantly, the study highlights that most of these reactions were mild to moderate, with mucocutaneous symptoms like hives and itching being the most common (occurring in 66.7% of failed challenges).

In contrast, severe, multisystemic reactions were rare in only four patients (2.0% of all challenges), though all required epinephrine. Statistical analysis identified two key comorbidities as significant predictors of a failed challenge: Children diagnosed with asthma were more likely to fail their OFC ($p = 0.028$), and a preexisting multi-food allergy was also a significant risk factor for a positive outcome ($p = 0.021$). Furthermore, the combined presence of asthma and prior history of anaphylaxis, or multi-food allergy with prior anaphylaxis, also increased the likelihood of OFC failure.

Finally, the present study's researchers used outcomes to derive predictive cutoff thresholds based on sIgE blood test levels to estimate whether subsequent OFCs will likely trigger an allergic reaction in the associated patient. For example, an sIgE level of 58.1 kU/L for baked milk challenges was identified as a useful cutoff, providing a good balance of sensitivity and specificity (AUC: 0.77). The authors also emphasized that this threshold should not be used to predict long-term tolerance development but rather as a supportive clinical tool for assessing OFC safety.

Conclusion

The present study underscores OFCs as safe and essential tools for diagnosing and managing pediatric food allergies. Appropriate patient selection and medical supervision are usually sufficient to prevent severe allergic reactions. Clinicians and parents should ensure that patients' medical histories are thoroughly scrutinized prior to OFC administration, particularly for children with asthma or multi-food allergies.

Combining a detailed clinical history with supportive measures like sIgE thresholds, used cautiously and in conjunction with clinical context, can help clinicians to optimize this crucial procedure's safety and diagnostic accuracy.

Source:

https://www.news-medical.net/news/20251008/Asthma-and-multiple-allergies-raise-the-risk-of-failed-oral-food-challenges.aspx