A standardised protocol for double-blind placebo-controlled food challenges with heated hen’s egg that is easy to perform

Susanne Schwarz, Mandy Ziegert, Saskia Albroscheit, Valerie Trendelenburg, Bodo Niggemann, Kirsten Beyer
Department of Pediatric Pneumology and Immunology, Charité Universitätsmedizin Berlin, Germany

Aim: Hen’s egg (HE) allergy is one of the most common food allergies in early childhood. However, previously it has been shown that about 80% of children allergic to raw HE can tolerate heated HE. As double-blind placebo-controlled food challenges (DBPCFC) are the gold standard in food allergy diagnostic, we intended to establish a standardized DBPCFC-protocol for heated HE that is simple in regard to preparation, blinding and titration and well accepted even by young children.

Methods: For the DBPCFC with heated HE, 55 g raw pasteurized HE (Wiesenhof) that equals 1 HE (7,095g HE protein) was heated for 1 minute in a microwave (800 watt) leading to 45 g heated HE. As a blinding matrix applesauce with cinnamon, chocolate pudding or vegetable puree was added. The mixture was blended and titrated in seven incremental dose steps containing 0.03 g, 0.1 g, 0.3 g, 1 g, 3 g, 10 g and 30 g of heated HE. For placebo the equivalent blinding matrix was used and rice powder was added to match the texture. If no reaction occurred during the titrated DBPCFC, a cumulative dose of 45 g heated HE was given another day. Children with allergic reaction to raw HE who tolerated at least 0.4 g of raw HE during the challenge were eligible for a challenge with heated HE.

Results: 50 children with allergic reaction to raw HE performed a DBPCFC with heated HE according to the protocol described above within 3 month after their positive DBPCFC to raw HE. The challenge meal was well accepted by every child. 43/50 children (86%) showed no allergic reaction to heated HE whereas 7/50 (14%) were allergic to raw and heated HE.

Discussion: Our standardized protocol for a DBPCFC with heated HE showed a high acceptance even in young children in regard to volume and taste. Using this protocol allows a simple, less time-consuming preparation method compared to baked egg protocols, especially if no oven is available on site. Furthermore it allows a more precise titration and masking of the DBPCFC. Our data on DBPCFC with heated HE confirm published data from other countries that the majority of children with HE allergy tolerate heated HE.

Conclusion: Preparation of heated HE in a microwave is a simple method for a DBPCFC with heated HE. A high proportion of children with raw HE allergy can tolerate heated HE, therefore standardized DBPCFC with heated HE should be performed in order to improve quality of life of HE allergic children.