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Serum tryptase measurement is useful to assess clinical positivity of oral food challenge to hazelnut in children

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Rationale: Oral Food challenge (OFC) is the milestone to access to a definitive diagnosis of hazelnut allergy (HA). We evaluated variation of serum tryptase levels during blinded OFC.

Population and Methods: 31 OFC were performed in children (20M/11F) aged 10.5 ± 4.9 y, referred to the allergy outpatient paediatric Unit. All underwent a reaction after hazelnut ingestion and were therefore suspected for allergy. Single blind placebo controlled OFC was performed according to usual recommendations: increments of native hazelnut were added every 30 minutes (0.1, 0.2, 0.5, 1, 2, 5, and 20 grams). Challenge was declared positive when a single objective symptom occurred. Sensitization to hazelnut was confirmed previously to OFC (positive SPT or specific IgE measurements over 0.10 IU/mL) and serum Tryptase was measured in µg/L (ImmunoCAP Tryptase, Phadia®) before (T₀) and one hour after the last increment of the challenge (T₁). We calculated Tryptase variation ΔT = T₁ - T₀ and Tryptase relative variation ΔT/T₀. Comparisons between the groups were performed using the Chi-square tests for categorical variables, and by the Student t-test or Kruskal-Wallis test for quantitative parameters.

Results: Among the 31 patients, 8 had a positive OFC to hazelnut (n = 8 OFC+) and 23 negative (n = 23 OFC-). At baseline the two groups of patients (OFC+ and OFC-) were similar in terms of sex, age, and reaction occurred when the diagnosis was settled. T₀ dosage did not differ significantly between OFC+ patients (4.83±5.57 µg/L) and OFC- patients (3.26±1.39 µg/L). T₁ was significantly higher in OFC+ patients (9.78±11.13 µg/L) than in OFC- patients (3.30±1.41 µg/L) (p = 0.03). Variation of serum Tryptase (ΔT) was significantly higher (p<0.001) in OFC+ patients (4.95 ± 6.67) than OFC- patients (0.04 ± 0.57). Moreover the relative variation of serum Tryptase ΔT/T₀ was significantly higher (p<0.001) in OFC+ patients (102 ± 145%) than in OFC- patients (3.74 ± 21.8%). Range of ΔT/T₀ varied from +11% to +450% in OFC+ patients and from -37% to +70%. Among the OFC- patients, all except 4 had a negative variation of Tryptase whereas none of the OFC+ had a negative variation of ΔT/T₀, thus confirming the good negative value of ΔT/T₀. Moreover the specific IgE to hazelnut did not differ in OFC+ and OFC- patients, neither the level of recombinant specific IgE to cor a 1, cor a 8, cor a 9 and cor a 14.

Conclusion: Unlike the baseline level of serum Tryptase, the relative variation of serum Tryptase during OFC (ΔT/T₀) is correlated to the clinical results of OFC in children suspected of HA. This ratio could be used to detect subclinical reactions during food challenge or to manage patients with subjective symptoms during OFC to hazelnut.