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Late reaction in Gal-Alpha-Gal allergy is reflected in serum levels after ingestion of pork kidney.

Introduction: Allergy to Gal alpha gal (GAG) is a rare type-1 allergy, where sensitization apparently is linked to tick-bites and where symptoms mainly occurs hours after ingestion of mammalian innards or meat, e.g. pork, beef and lamb. The mechanism behind the late reaction-pattern is unclear, i.e. whether the delaying is due to slow absorption, encapsulation in lipoproteins, slow release or exerted Tat effector-cell level. Our aim was with an indirect method to investigate serum levels of GAG allergens after ingestion of pork-kidney being a main source of GAG with peanut as reference allergen.

Method: Six healthy volunteers ingested with minimum 1 week separation 100 gr. defatted peanut-flour suspended in water, 87 gr. blended, raw pork-kidney as a smoothie or 87 gr. fried pork-kidney with vegetable garniture. Blood samples were drawn at baseline (t=0) and repetitively at 15 min, 30 min, 1h, 2h, 3h, 4h, 6h, 8h and 24h after ingestion. Donor basophils were stripped-off IgE and passively sensitized using sera containing high IgE titer against peanut or GAG, respectively. Basophils were incubated with the serum samples in 12 dilutions and residual cellular histamine was measured by the glass fiber method and results expressed as per cent Histamine Release (HR). Differences in release were tested with Wilcoxon signed rank sum to HR-values normalized to equal max-release (100%).

Results: Max releases were for peanut reached after 2 hours, 3 hours for pork-kidney-smoothie and 6 hours for pork-kidney. Time to 50 % of max release, T½max, was extrapolated to 22 min, 50 min and 2 hours for peanut, smoothie and pork-kidney respectively. There was a significant difference in HR and thereby in absorption between peanut and smoothie after 30 min and 1h, between peanut and pork-kidney after 15 min, 30 min, 1 h and 2 h, and smoothie and pork-kidney after 1h and 2 hours.

Conclusion: This study shows that HR from basophils can be used to detect serum-levels of allergenic proteins. The measured levels of absorbed allergen from peanut and fried pork-kidney reflect the clinical situation in peanut and GAG allergy; peanut is measurable in serum 15 min. after ingestion, whereas pork-kidney levels are only detected much later. By changing the matrix of pork-kidney into a blended, drinkable smoothie, absorption speed increased indicating that the late reaction of GAG might be influenced by passage-timing of the stomach.