

HMOs and allergic sensitization: current evidence



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Key message

Currently there is scientific evidence linking HMOs and more particularly 2 FL and LNnT with the prevention of allergic sensitization. The results both from preclinical and clinical observational data, from the LIFE Child Cohort, demonstrates a positive effect of 2FL and LNnT in reduction of allergic sensitization.

Abstract

Background: Human Milk Oligosaccharides (HMOs) represent a family of approximately 200 complex carbohydrates present in human milk. They are the third-largest solid component in breast milk after fat and lactose. HMOs have been shown to strengthen the gut barrier function and to block pathogens. They are also known for their prebiotic effect and for promoting beneficial intestinal microbiota growth and stimulating the immune system.

Aim: Here we aimed at understanding the effect of a HMO on allergy prevention in preclinic and human.

Methods: The role of specific HMO (2'FL and LNnT) on allergic sensitization prevention and tolerance induction was investigated in preclinical experiments (epicutaneous sensitization and mucosal sensitization models). The nutritional intervention was performed

with a blend of 2 HMO (2'FL and LNnT) added to the diet at 0.2, 1, 5 and 10% . In the LIFE Child cohort in Leipzig, Germany, allergic sensitization and allergic symptoms were recorded in the infants up to 1 year old. Milk samples were collected from lactating mothers participating in the LIFE Child cohort in Leipzig, Germany. A total of 25 HMOs were analyzed in 156 breast milk samples, collected at 3 months after birth.

Results: In preclinical models, oral administration of the blend of 2'FL and LNnT at 1 or 5% supplementation in the diet consistently decreased allergic sensitization in the epicutaneous or mucosal sensitization models respectively. The HMO blend administration also induced modulation of the gut microbiota and SCFA production as well as an increase in regulatory T cell numbers in the mesenteric lymph nodes. From the observational human study, levels of 2'FL ranging from 0.8 to 2.5g/L in the mother breast milk were positively associated with a decreased risk of sensitization in the infants.

Conclusion: Altogether, these data suggest that specific doses of 2'FL and LNnt are associated with decreased allergic sensitization.

References:

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