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Gut permeability and food allergies.

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Abstract

Intestinal permeability is a critical feature of the gastrointestinal epithelium as it must allow an efficient passage of nutrients and restrict the entry of larger molecules, such as protein antigen, in order to facilitate appropriate immune responses towards food antigens. The proper regulation of the epithelial barrier relies on multiple, intricate physiological and immunologic mechanisms, in terms of which recent progresses regarding the cellular and molecular components have been unravelled. In genetically predisposed individuals, breakdown of oral tolerance can occur, leading to the inadequate production of allergen-specific IgE and the recruitment of mast cells in the gastrointestinal mucosa. Under such conditions, the intestinal permeability towards allergen is altered via different mechanisms, with IgE-CD23-mediated transport across the mucosa playing an important amplification role. Additionally, during the effector phase of the allergic reaction, when mast cells degranulate, a series of inflammatory mediators, such as proteases and cytokines, are released and further affects intestinal permeability. This leads to an increase in the passage of allergens and hence contributes to perpetuate the inflammatory reaction. In this review, we describe the importance of properly balanced intestinal permeability in oral tolerance induction and address the processes involved in damaging the intestinal barrier in the sensitized epithelium and during allergic reactions. We conclude by speculating on the effect of increased intestinal permeability on the onset of sensitization towards dietary antigens.

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