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Anisakis extract induces inflammation process: in vitro and ex-vivo study

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Abstract

Anisakis is a parasites known to cause allergies in humans when dead larvae are introduced with food. Recently, it has been observed that also inhalation of aerosols containing Anisakis antigens, especially in fish industries and markets workers and in fish restaur cooks, causes allergic reactions and in some cases asthma. Pro-inflammatory response

associated to allergic reactions are dominated by increase of alarmins (TSLP and IL-33) and chemokines (IL-8). The pathogenetic mechanisms involved in sensitization to inhaled Anisakis antigens are not yet fully understood.

The aim of the present study was to investigate whether Anisakis antigens induced the respiratory epithelium to release cytokines involved in innate (IL-8) and adaptive (IL-33 and TSLP) immune systems activation and to compare this effect with that activated by the ingestion.

To this purpose, IL-8, IL-33 and TSLP gene expression and release were evaluated in a bronchial (16HBE) and intestinal (Caco-2) epithelial cell line stimulated with a crude extract of Anisakis larvae. We also evaluated TSLP concentration in serum of fish workers (N=14) compared to the serum of control subjects (N=11).

The results showed that Anisakis extract induced IL-8, IL-33 and TSLP gene expression and release in both 16HBE and Caco-2. We found a higher concentration of TSLP in the serum of fish workers compared to controls.

We can conclude that Anisakis extract could induce an uncontrolled activation of the innate and adaptive immune systems at respiratory as well as intestinal mucosal levels. In fish workers, the aerosol dispersion of anisakis antigens may have a relevant impact on airway mucosa thus increasing the risk of the onset of asthma.

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