Seasonal allergic rhinoconjunctivitis and fatty acid intake: A cross-sectional study in Japan.

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PURPOSE:
To investigate the associations of fatty acid intake with seasonal allergic rhinoconjunctivitis.

METHODS:
The study subjects consisted of 1,012 women aged 22 to 57 years.

They completed a self-administered questionnaire on symptoms of the disease in August 1998.

Symptoms of seasonal allergic rhinoconjunctivitis in spring were determined by response to the questionnaire, and fatty acid intake was estimated using a food frequency questionnaire.

RESULTS:
An increasing trend in the ORs was observed with increasing dietary intake of n-6 polyunsaturated fatty acids.

Consumption of saturated, monounsaturated, and n-3 polyunsaturated fatty acids was not significantly related to the symptoms.

CONCLUSIONS:
Dietary intake of n-6 polyunsaturated fatty acids was positively associated with seasonal allergic rhinoconjunctivitis in spring.

THESE AUTHORS ALSO NOTE:

INTRODUCTION

“The prevalence of allergic rhinoconjunctivitis or hay fever has been rapidly increasing in developed countries including Japan.”

Exposure to pollen and other factors does not fully explain the increasing trend in prevalence.

Recently, polyunsaturated fatty acids (PUFA) have attracted attention in relation to allergic disease.
“Changes in the dietary intake of fatty acids may partly explain the increasing prevalence of allergic rhinoconjunctivitis.”

The questionnaire used for this study was validated.

Symptoms, along with dietary levels for saturated fatty acids (SFA), monounsaturated fatty acids (MUFA), and all, n-3 and n-6 PUFA, were assessed.

DISCUSSION

The authors found a “positive association between the dietary intake of n-6 PUFA and symptoms of seasonal allergic rhinoconjunctivitis in spring with a dose-response relationship.”

“Insufficiency in dietary antioxidants would increase susceptibility to airway inflammation and may result in allergic rhinitis.”

“Such antioxidants as vitamins A (including carotene), C, and E, and zinc, therefore, might confound the association of n-6 PUFA with seasonal allergic rhino-conjunctivitis. Adjustments for intakes of these nutrients, however, did not materially alter the ORs for n-6 PUFA. This indicates that the association observed with n-6 PUFA is independent of these antioxidants.”

“The present study indicated that the higher the dietary intake of n-6 PUFA, the larger the risk of seasonal allergic rhinoconjunctivitis.”

“These fatty acids, mainly linoleic acid, may facilitate the synthesis of prostaglandin E2, which in turn may promote allergic sensitization by inhibiting the formation of interferon and by promoting the IgE synthesis.”

In recent decades, dietary intake of n-6 PUFA has greatly increased in Japan. This increased intake of n-6 PUFA has also occurred in other countries, mainly due to the increased supply of vegetable oils, which are major sources of n-6 PUFA.

Vegetable oil in the USA has increased from 9.6% of total energy in 1961 to 14.9% in 1997.

“The increased prevalence of hay fever or allergic rhinoconjunctivitis, therefore, may be partly ascribable to the increase in n-6 PUFA.”
It was observed in the former East Germany that the prevalence of hay fever was higher among children whose parents reported increased consumption of margarine and decreased use of butter.

“Margarine contains about 10–20 times more n-6 PUFA than butter.”

Margarine also contains high levels of trans fatty acids, which are also positively correlated with the prevalence of allergic rhinoconjunctivitis.

Findings support the role of n-6 PUFA in the etiology of allergic rhinoconjunctivitis.

This article adds to the evidence that excess dietary n-6 PUFA from plant oils and margarine are pro-inflammatory (produce prostaglandin E2), which adversely alter the function of the immune system. This increases the prevalence of hay fever or allergic rhinoconjunctivitis.

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