

# Allergies

J Med Food. 2005 Spring;8(1):27-30.

## **Effects of a Spirulina-based dietary supplement on cytokine production from allergic rhinitis patients.**

[Mao TK](#), [Van de Water J](#), [Gershwin ME](#).

Division of Rheumatology/Allergy and Clinical Immunology, University of California at Davis, School of Medicine, Davis, California, USA.

Spirulina represents a blue-green alga that is widely produced and commercialized as a dietary supplement for modulating immune functions, as well as ameliorating a variety of diseases. We have previously shown that the in vitro culture of Spirulina with human peripheral blood mononuclear cells (PBMCs) modulated the production of cytokines. In the present study, we evaluated the impact of a Spirulina-based dietary supplement (Earthrise Nutritionals, Inc., Irvine, CA) on patients with allergic rhinitis by assessing the production of cytokines [interleukin (IL)-4, interferon (IFN)-gamma, and IL-2] critical in regulating immunoglobulin E-mediated allergy. In a randomized double-blinded crossover study versus placebo, allergic individuals were fed daily with either placebo or Spirulina, at 1,000 mg or 2,000 mg, for 12 weeks. PBMCs isolated before and after the Spirulina feeding were stimulated with phytohemagglutinin (PHA) prior to determining the levels of cytokine from cell culture supernatants. Although Spirulina seemed to be ineffective at modulating the secretion of Th1 cytokines (IFN-gamma and IL-2), we discovered that Spirulina, administered at 2,000 mg/day, significantly reduced IL-4 levels by 32% from PHA-stimulated cells. These results indicate that Spirulina can modulate the Th profile in patients with allergic rhinitis by suppressing the differentiation of Th2 cells mediated, in part, by inhibiting the production of IL-4. To our knowledge, this is the first human feeding study that demonstrates the protective effects of Spirulina towards allergic rhinitis.

Publication Types:

- Clinical Trial
- Randomized Controlled Trial

PMID: 15857205 [PubMed - indexed for MEDLINE]

## **The effects of spirulina on allergic rhinitis.**

[Cingi C](#), [Conk-Dalay M](#), [Cakli H](#), [Bal C](#).

Department of of ENT, Eskisehir Osmangazi University Medical Faculty,  
Eskisehir, Turkey. [cemal@cemalcingi.com](mailto:cemal@cemalcingi.com)

The prevalence of allergic rhinitis is increasing globally due to various causes. It affects the quality life of a large group of people in all around the world. Allergic rhinitis still remains inadequately controlled with present medical means. The need of continuous medical therapy makes individuals anxious about the side effects of the drugs. So there is a need for an alternative strategy. Effects of spirulina, tinospora cordifolia and butterbur were investigated recently on allergic rhinitis in just very few investigations. Spirulina represents a blue-green alga that is produced and commercialized as a dietary supplement for modulating immune functions, as well as ameliorating a variety of diseases. This double blind, placebo controlled study, evaluated the effectiveness and tolerability of spirulina for treating patients with allergic rhinitis. Spirulina consumption significantly improved the symptoms and physical findings compared with placebo ( $P < 0.001^{***}$ ) including nasal discharge, sneezing, nasal congestion and itching. Spirulina is clinically effective on allergic rhinitis when compared with placebo. Further studies should be performed in order to clarify the mechanism of this effect.

Publication Types:

- Comparative Study
- Randomized Controlled Trial

PMID: 18343939 [PubMed - indexed for MEDLINE]

**'Complementary ENT': a systematic review of commonly used supplements.**

[Karkos PD](#), [Leong SC](#), [Arya AK](#), [Papouliakos SM](#), [Apostolidou MT](#), [Issing WJ](#).

Department of Otolaryngology, University Hospital Aintree, Liverpool, UK.  
[pkarkos@aol.com](mailto:pkarkos@aol.com)

**OBJECTIVE:** To assess the evidence surrounding the use of certain complementary supplements in otolaryngology. We specifically focussed on four commonly used supplements: spirulina, Ginkgo biloba, Vertigoheel and nutritional supplements (cod liver oil, multivitamins and pineapple enzyme). **MATERIALS AND METHODS:** A systematic review of the English and foreign language literature. Inclusion criteria: in vivo human studies. Exclusion criteria: animal trials, in vitro studies and case reports. We also excluded other forms of 'alternative medicine' such as reflexology, acupuncture and other homeopathic remedies. **RESULTS:** Lack of common outcome measures prevented a formal meta-analysis. Three studies on the effects of spirulina in allergy, rhinitis and immunomodulation were found. One was a double-blind, placebo, randomised, controlled trial (RCT) of patients with allergic rhinitis, demonstrating positive effects in patients fed spirulina for 12 weeks. The other two studies, although non-randomised, also reported a positive role for spirulina in mucosal immunity. Regarding the use of Ginkgo biloba in tinnitus, a Cochrane review published in 2004 showed no evidence for this. The one double-blind, placebo-controlled trial that followed confirmed this finding. Regarding the use of Vertigoheel in vertigo, two double-blind RCTs and a meta-analysis were identified. The first RCT suggested that Vertigoheel was equally effective in reducing the severity, duration and frequency of vertigo compared with betahistine. The second RCT suggested that Vertigoheel was a suitable alternative to G. biloba in the treatment of atherosclerosis-related vertigo. A meta-analysis of only four clinical trials confirms that Vertigoheel was equally effective compared with betahistine, G. biloba and dimenhydrinate. Regarding multivitamins and sinusitis, two small paediatric pilot studies reported a positive response for chronic sinusitis and otitis media following a course of multivitamins and cod liver oil. Regarding bromelain (pineapple enzyme) and sinusitis, one randomised, multicentre trial including 116 children compared bromelain monotherapy to bromelain with standard therapy and standard therapy alone, for the treatment of acute sinusitis. The bromelain monotherapy group showed a faster recovery compared with the other groups. **CONCLUSION:** The positive effects of spirulina in allergic rhinitis and of Vertigoheel in vertigo are based on good levels of evidence, but larger trials are required. There is overwhelming evidence that G. biloba may play no role in tinnitus. There is limited evidence for the use of multivitamins in sinus symptoms, and larger randomised trials are required.

Publication Types:

PMID: 17125579 [PubMed - indexed for MEDLINE]

Allergies

## **Complementary and alternative medicine for allergic rhinitis.**

### **Man LX.**

Department of Otolaryngology, University of Pittsburgh School of Medicine, Pittsburgh, Pennsylvania, USA.

**PURPOSE OF REVIEW:** Otolaryngologists and other physicians who diagnose and treat allergic rhinitis encounter patients who use complementary medicine and alternative remedies. This article reviews the recent literature regarding complementary and alternative therapies for the treatment of allergic rhinitis. **RECENT FINDINGS:** There are a myriad of modalities for treating allergic rhinitis. Few are studied with rigorous randomized, double-blind, placebo-controlled trials for clinical efficacy. Often, the biological mechanisms and adverse effects are even less well understood. A few therapies, including spirulina, butterbur, and phototherapy hold some promise. Thus far, complementary and alternative therapies have not been integrated into the general treatment armamentarium of allergic rhinitis. **SUMMARY:** Several studies report beneficial effects of certain alternative treatments for allergic rhinitis. Additional insight into the mechanisms of action, short-term and long-term effects, and adverse events is needed.

PMID: 19262383 [PubMed - as supplied by publisher]

**Class specific influence of dietary *Spirulina platensis* on antibody production in mice.**

[Hayashi O](#), [Hirahashi T](#), [Kato T](#), [Miyajima H](#), [Hirano T](#), [Okuwaki Y](#).

Department of Health and Nutrition, Kagawa Nutrition University, Sakado, Japan.

In the present study, we investigated antibody productions of IgA and other classes, such as IgE and IgG1, in mice as possible evidence of the protective effects of *Spirulina* toward food allergy and microbial infection. An increase of IgE antibody level in the serum was observed in the mice that were orally immunized with crude shrimp extract as an antigen (Ag group). The antibody level, however, was not further enhanced by treatment with *Spirulina* extract (SpHW). IgG1 antibody, on the other hand, which was increased by antigen administration, was further enhanced by *Spirulina* extract. It was noted that the IgA antibody level in the intestinal contents was significantly enhanced by treatment with *Spirulina* extract concurrently ingested with shrimp antigen, in comparison with that of the Ag group treated with shrimp antigen alone. An enhancement of IgA antibody production by *Spirulina* extract was also observed in culture supernatant of lymphoid cells, especially in the spleen and mesenteric lymph node from mice treated with *Spirulina* extract for 4 weeks before antigen stimulation. These results suggest that *Spirulina* may at least neither induce nor enhance allergic reaction such as food allergy dependent on an IgE antibody, and that when ingested both concurrently with antigen and before antigen stimulation, it may significantly enhance the IgA antibody level to protect against allergic reaction.

PMID: 10197315 [PubMed - indexed for MEDLINE]

**Inhibitory effect of mast cell-mediated immediate-type allergic reactions in rats by spirulina.**

[Kim HM](#), [Lee EH](#), [Cho HH](#), [Moon YH](#).

Department of Oriental Pharmacy, College of Pharmacy, Wonkwang University, Iksan, Chonbuk, South Korea. [hmkim@med.wonkwang.ac.kr](mailto:hmkim@med.wonkwang.ac.kr)

We investigated the effect of spirulina on mast cell-mediated immediate-type allergic reactions. Spirulina dose-dependently inhibited the systemic allergic reaction induced by compound 48/80 in rats. Spirulina inhibited compound 48/80-induced allergic reaction 100% with doses of 100-1000 microg/g body weight, i.p. Spirulina (10-1000 microg/g body weight, i.p.) also significantly inhibited local allergic reaction activated by anti-dinitrophenyl (DNP) IgE. When rats were pretreated with spirulina at a concentration ranging from 0.01 to 1000 microg/g body weight, i.p., the serum histamine levels were reduced in a dose-dependent manner. Spirulina (0.001 to 10 microg/mL) dose-dependently inhibited histamine release from rat peritoneal mast cells (RPMC) activated by compound 48/80 or anti-DNP IgE. The level of cyclic AMP in RPMC, when spirulina (10 microg/mL) was added, transiently and significantly increased about 70-fold at 10 sec compared with that of control cells. Moreover, spirulina (10 microg/mL) had a significant inhibitory effect on anti-DNP IgE-induced tumor necrosis factor-alpha production. These results indicate that spirulina inhibits mast cell-mediated immediate-type allergic reactions in vivo and in vitro.

Publication Types:

- Research Support, Non-U.S. Gov't

PMID: 9605430 [PubMed - indexed for MEDLINE]

**[Experimental study of spirulina platensis in treating allergic rhinitis in rats]**

[Article in Chinese]

[Chen LL](#), [Zhang SF](#), [Huang DN](#), [Tan JQ](#), [He SH](#).

Department of Otorhinolaryngology, Affiliated Hospital of Guangdong Medical College, Zhanjiang 524001, China.

**OBJECTIVE:** To determine the therapeutic effect of spirulina platensis in allergic rhinitis (AR). **METHODS:** Ovalbumin sensitized white rats used as AR animals were treated with spirulina platensis (SPP). At the end of the treatment, the differences in the behavior science were observed; the changes in the nasal mucosa and mast cell degranulation were studied pathologically; and the levels of serum histamine and total immunoglobulin (Ig) E were determined by enzyme-linked immune sorbent assay. **RESULTS:** The behavior science score of the SPP treatment group was lower than that of the negative control group ( $P < 0.01$ ); inflammatory reaction of nasal mucosa in the SPP treatment group were remarkably relieved; the number of nasal mucosa mastocyte and mast cell degranulation in the SPP treatment group were lower than that of the negative control group ( $P < 0.01$ ). The levels of serum histamine and total IgE in the SPP treatment group were lower than that of the negative control group ( $P < 0.01$ ). It had no significant difference in the positive control group and the SPP treatment group and the blank control group ( $P > 0.05$ ). **CONCLUSION:** Spirulina platensis can prevent and treat AR in rats, which implies the possibility of using spirulina platensis for AR patients in the future.

Publication Types:

- English Abstract
- Research Support, Non-U.S. Gov't

PMID: 15871200 [PubMed - indexed for MEDLINE]