Complementary and alternative medicine for allergic rhinitis
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Introduction
Complementary and alternative medicines (CAMs) are frequently used to treat allergic rhinitis worldwide. The percentage of adults who are using or have used CAM treatments ranges from 25 to 50% in France and Australia [1,2]. Among adults in the United States, over one-third report using CAM treatments [3], and up to one-half with asthma or rhinosinusitis have tried such treatments [4]. The use of CAM therapies has increased over the past several decades, and trends indicate that use will continue to increase [2,3].

Given the increasing prevalence of allergic diseases, it is essential that otolaryngologists and other physicians treating allergic rhinitis understand the array of CAM therapies used by their patients. Knowledge of the clinical efficacy as well as adverse effects of these treatments is necessary so that healthcare practitioners can appropriately guide their patients, especially because over 50% of those using CAM therapies do not disclose their use to their physicians [2,5]. This article reviews the current literature regarding various CAM treatments for allergic rhinitis.

Acupuncture
Developed from traditional Chinese medicine techniques, acupuncture involves the stimulation of specific points located along lines of meridians corresponding to the flow of energy through the body. Traditionally, these acupoints were stimulated using fine needles. Modern acupuncture has evolved to include the application of pressure, the use of electric currents, and the use of low-intensity lasers to stimulate the acupoints.

Acupuncture is the third most common CAM treatment for allergies in Germany [6]. Acupuncture is thought to modulate levels of cytokines and other inflammatory mediators, and one recent study showed decreased expression of interleukin (IL)-1 receptor-α up to 4 weeks after therapy [7]. Rigorous evidence on the scientific basis and clinical efficacy of acupuncture is lacking [8,9].

Most clinical studies are nonrandomized and poorly designed. A recent systematic review identified only seven randomized 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.

Keywords
allergy, alternative medicine, complementary medicine, rhinitis
sham or inactive acupuncture. The second study [12*] evaluated the use of acupuncture versus sham acupuncture in 80 patients with perennial allergic rhinitis over an 8-week treatment and 12-week follow-up period. The active acupuncture group had significantly decreased total nasal symptom score and rhinorrhea at the end of both treatment and follow-up periods compared with the sham group. This was not correlated with any significant reduction in the use of antihistamines, nasal decongestants, or intranasal steroids in the active acupuncture group. Based on the current evidence, there is insufficient proof to substantiate or refute the use of acupuncture in allergic rhinitis.

**Dietary and nutritional supplements**

There is an increase interest in dietary and nutritional supplements for the treatment of allergic rhinitis.

**Capsaicin**

Capsaicin (8-methyl-n-vanillyl-6-nonenamide), the pungent component of chili peppers, is used topically as an ointment for pain relief in peripheral neuropathy. Capsaicin is thought to block neuropeptides, especially substance P, via the capsaicin [transient receptor potential vanilloid subfamily 1 (TRPV1)] receptor, which is expressed in various nasal mucosal cells [13]. Nasal mucosal nerve fibers immunoreactive to substance P have been found to be increased in patients with allergic rhinitis [14], and stimulation of the TRPV1 receptor with capsaicin has been shown to induce the production of IL-6 [15]. A recent Cochrane Systematic Review of capsaicin for allergic rhinitis identified only one RCT meeting study criteria [16]. In this study, capsaicin was not effective in treating symptoms of perennial allergic rhinitis to dust mites [17].

**Fish oil and ω-3 polyunsaturated fatty acids**

Fish oil contains eicosapentaenoic and docosahexaenoic acids, which are ω-3 polyunsaturated fatty acids (ω-3 PUFA). They have anti-inflammatory effects *in vitro* and have a wide range of beneficial health effects in various chronic inflammatory diseases [18]. Epidemiologic evidence suggests a link between declining consumption of ω-3 PUFA and a rise in the prevalence of allergic diseases [19*,20]. Meta-analyses of RCTs evaluating fish oil supplementation in adults for allergic diseases such as asthma and atopic dermatitis have shown limited benefit [18]. There are few data on allergic rhinitis. One older double-blind, placebo-controlled trial of fish oil supplementation in adults showed no significant differences in nasal symptoms between groups [21]. On the other hand, there is recent evidence in cross-sectional studies [22,23*] that the intake of eicosapentaenoic and docosahexaenoic acids may be associated with a reduced prevalence of allergic rhinitis. Maternal perinatal consumption of fish oil and ω-3 PUFA has been postulated to prevent the development of allergic disease in infants [19*].

**Spirulina**

Spirulina, the dried biomass of the blue-green algae *Arthospira platensis*, has a long history as a food source. It is believed to have been a food source for the Aztecs in 16th-century Mexico and the Kanem Empire in 9th-century Chad. Spirulina is rich in protein (up to 70% by dry weight), containing all essential amino acids. It also contains essential fatty acids, vitamins, minerals, and β-carotene. The supplement is considered to be safe for human consumption by the US Food and Drug Administration. Spirulina is thought to inhibit histamine release from mast cells [24*,25]. In one RCT, patients taking spirulina for 12 weeks had a significant reduction in blood IL-4 levels [26]. More recently, a double-blind, placebo-controlled study [27***] demonstrated a significant reduction in nasal symptom scores in clinically diagnosed allergic rhinitis patients taking spirulina daily for 6 months. Although the preliminary data are promising, additional studies are needed to determine both the efficacy and the active pharmacologic agent of spirulina.

**Herbal medicines**

There are numerous herbal remedies for allergic rhinitis, due in part to their history of use in the traditional Indian Ayurvedic and Chinese medical systems. A well written systematic review of herbal medicines for the treatment of allergy has recently been published [28**]. Recent updates to the literature for some of the most well known herbal medicines are discussed below.

**Ayurvedic medicine**

Aller-7 is a formulation of seven Indian herbal extracts that has shown some efficacy in relieving symptoms of allergic rhinitis [28**,29]. It is thought to act through antioxidant and anti-inflammatory pathways [30–32]. Tinofend (Verdure Sciences, Noblesville, Indiana, USA), *Tinospora cordifolia*, is an Indian herbal tablet that has also been shown to offer symptom relief compared with placebo [33]. There have been no recent data to support the use of these formulations, although a review of Tinofend has been published recently [34].

**Butterbur**

Butterbur (*Petasites hybridus*) is a perennial shrub native to Europe, southwestern Asia, and North America. The leaf and root extracts contain sesquiterpenes (petasins) as pharmacologically active compounds that have been used to treat asthma, migraine headaches, and smooth muscle spasms. Preclinical studies suggest that petasins may inhibit leukotriene and histamine synthesis [28**] as well as mast cell degranulation [35]. Raw butterbur extract...
contains pyrrolizidine alkaloids that are hepatotoxic and carcinogenic [36]. Petasin (Ze 339), an extract of butterbur leaves with the alkaloids removed, was approved in 2003 in Switzerland for the treatment of seasonal allergic rhinitis (Tesalin; Zeller AG, Romanshorn, Switzerland). A postmarketing survey found side effects were mainly nonspecific gastrointestinal complaints occurring at a rate of 4% [37].

In randomized, double-blind, placebo-controlled studies, Ze 339 was found to significantly improve symptom scores compared with placebo [38] and to be comparable in efficacy with cetirizine [39] and fexofenadine [40,41]. However, another double-blind, placebo-controlled crossover study [42] demonstrated no difference in symptom scores and peak nasal airflow compared with placebo. There have been no newer trials published.

The long-term effects of butterbur are unknown. Moreover, the therapeutic mechanism remains uncertain. In a study comparing Ze 339 with an antihistamine and placebo in skin-prick tests [43], Ze 339 did not inhibit skin-test reactivity to the allergens tested, raising the question of whether Ze 339 has any antihistaminic effect. Although preliminary data suggest butterbur may be effective in allergic rhinitis, additional studies are needed to better elucidate the efficacy, safety, and pharmacologic mechanism.

**Traditional Chinese medicine**

Laboratory studies suggest the Chinese herbal remedy Shi-bi-lin may inhibit the release of IL-4 and tumor necrosis factor-α (TNF-α) [44]. Shi-bi-lin was found to decrease sneezing, nasal scratching, and thromboxane B2 levels in a guinea pig model [45,46]. A human safety and efficacy study has been recently completed [47]. Patients with perennial allergic rhinitis confirmed with skin-prick tests were randomized to low-dose Shi-bi-lin or placebo in a double-blind trial. Symptoms scores and quality-of-life indicators improved in both treatment and placebo groups and there was no statistically significant difference between groups. However, symptoms remained improved 2 weeks after the completion of Shi-bi-lin treatment, whereas symptoms returned to baseline in the placebo group.

Xiao-qing-long-tang, better known as Sho-seiryu-to (TJ-19) in Japanese, an extract of eight traditional Chinese herbs is used to treat the common cold, asthma, and allergic rhinitis. It is marketed in Japan but is not available in the United States as ephedra is one of the ingredients. It was tested in patients with perennial allergic rhinitis with efficacy for nasal symptoms [28**]. Sho-seiryu-to has recently been found to inhibit histamine signaling and IL-4 and IL-5 gene expression in a rat model [48].

Biminne [49], an 11-herb formulation, and RCM-101 [50], an 18-herb formulation, have been found to improve symptom scores when compared with placebo in older, single-study trials, but these results have not been replicated. Recent research has focused on the mechanisms of RCM-101. In animal models, RCM-101 inhibited histamine release [51], prostaglandin E2 production [51,52], and nitric oxide synthesis [52,53].

**Other herbal remedies**

Single randomized, controlled trials for *Urtica dioica* (stinging nettle), grape seed extract, and *Perilla frutescens* for the treatment of allergic rhinitis have been recently reviewed [28**,54**]. There have been no recent new data to support their use.

**Homeopathy**

Homeopathy is based on the premise that diseases can be cured if the same substances that provoke the symptoms of the disease are given in ultra-diluted form. Homeopathic treatments are selected on the basis of symptoms and prepared with repeated dilution and ‘potentiation’.

There are several controlled studies for homeopathy and allergic rhinitis. In the most recent randomized, double-blind controlled trial, investigators compared a homeopathic preparation of grass, tree, and weed allergens with placebo and found significantly better quality-of-life questionnaire scores in patients in the active treatment group [55]. Studies showing positive results for homeopathy are counterbalanced with a comparable number of negative studies [56,57]. Some homeopathic preparations actually exacerbated symptoms [58,59].

Although the published literature suggests homeopathy has some effect, there is controversy on whether the results of homeopathy are actually placebo effects [60]. A recent study [61] comparing placebo-controlled trials of homeopathy matched 1:1 to conventional allopathic treatment by disease and outcome concluded that the evidence for specific beneficial effects of homeopathic treatments is weak after controlling for biases and confounding factors. Overall, there is inadequate evidence to recommend homeopathy for the treatment of allergic rhinitis.

**Phototherapy**

Phototherapy with ultraviolet (UV) light is used for the treatment of immune-mediated dermatologic conditions such as psoriasis. The therapeutic mechanism of UV light is attributed to its immunosuppressive effects, including the reduction of antigen presentation by dendritic cells, inhibition of pro-inflammatory cytokine synthesis and release, and induction of apoptosis in immune cells...
with placebo. The data on acupuncture are mixed, with treatments, although some beneficial effects compared for allergic rhinitis is limited. None of the therapies Evidence on the therapeutic efficacy of CAM treatments Conclusion

Physical techniques and other complementary treatments

Physical techniques (biofeedback, breathing control, chiropractic manipulation, and yoga) have not been studied in allergic rhinitis. One recent cross-sectional study of children in western Europe [69] found the prevalence of allergies was lower in children from anthroposophic families. Anthroposophy is a spiritual philosophy based on a belief that an objective spiritual world is accessible through inner development. The anthroposophic lifestyle includes avoiding antibiotics, antipyretics, and vaccinations. No RCTs on allergic rhinitis have been performed with other complementary treatments, including anthroposophy, aromatherapy, Bach’s flowers, chromotherapy, clinical ecology, Hopi candles, hydrocolon, iridology, reflexology, and urine therapy.

UV light induces DNA damage and, at high doses, is associated with carcinogenesis. A recent study of nasal cytology samples from patients undergoing intranasal phototherapy [67] demonstrated UV-specific markers of photodamage 10 days after treatment to be similar to baseline. Another study [68] suggested markers of DNA damage found elevated immediately after phototherapy were not present within several days of treatment. Nevertheless, the long-term effect of phototherapy on nasal mucosa is unknown.

UV light that is approved and marketed in Hungary [62**]. One group in Hungary has studied the use of narrow-band UV light as intranasal therapy for allergic rhinitis. Early uncontrolled studies using a 308 nm UV-B laser [63] and UV-A light and psoralen [64] showed improvement in nasal symptom scores. A randomized, double-blind controlled trial using a combination of low-dose UV-B, low-dose UV-A, and visible light in patients with ragweed-induced allergic rhinitis resulted in decreased nasal symptom scores and reduced levels of eosinophils and IL-5 [65]. The researchers then found the combination phototherapy to be superior to fexofenadine in the reduction of rhinorrhea, nasal obstruction, and total symptom score [66]. The only side effect of intranasal phototherapy in these studies was dryness of the nasal mucosa. These investigators have developed a phototherapeutic device (Rhinolight; Rhinolight Ltd., Szeged, Hungary) for the intranasal delivery of combination of low-dose UV-B, low-dose UV-A, and visible light that is approved and marketed in Hungary [62**].

some RCTs demonstrating efficacy while others showed no effect. Fish oil and ω-3 PUFA intake is associated with decreased prevalence of allergic rhinitis in epidemiological studies, but not corroborated by RCTs. Spirulina and butterbur are two herbal remedies that show promise and may eventually prove to be useful when used in combination with established treatments. Phototherapy is a new modality for allergic rhinitis that is grounded in scientific and clinical data from the dermatology literature. Additional data on the mechanisms, clinical efficacy, drug interactions, and side effects of CAM treatments are needed.

References and recommended reading

Papers of particular interest, published within the annual period of review, have been highlighted as: • of special interest ++ of outstanding interest

Additional references related to this topic can also be found in the Current World Literature section in this issue (pp. 247–248).

This article summarizes the evidence regarding butterbur for allergic rhinitis and is useful for the reader seeking more in-depth information on this specific treatment. This article examines the literature in greater detail but is limited to herbal treatments useful for the reader seeking more in-depth information on this specific treatment.


62 Kemeny L, Koreck A. Ultraviolet light phototherapy for allergic rhinitis. J Photochem Photobiol B 2007; 87:58–65. This article summarizes the scientific basis of understanding and clinical trials regarding phototherapy for allergic rhinitis.


