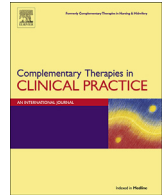




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Providing evidence for use of Echinacea supplements in Hajj pilgrims for management of respiratory tract infections



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ABSTRACT

Objective: To evaluate potential applicability of Echinacea use for management of respiratory tract infections in Hajj travelers.

Method: The PubMed database was explored with Mesh terms “Echinacea” and “Respiratory Tract Infections”.

Results: A hundred journal articles were yielded but only 66 most relevant ones used for the review.

Conclusion: There is a considerable amount of evidence that shows effectiveness of Echinacea products in prevention and treatment of respiratory tract infections in this setting. Although there are some controversial findings, utilization of standardized products with adequate dose or combinations with other immune-stimulants in controlled and well-designed trials will be highly encouraging.

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1. Introduction

Echinacea is a herbal supplement that is well-known for immune-boosting effects. By now growing evidence could be found in medical literature that reveals potential benefits of Echinacea-derived products in prevention and treatment of infectious

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complications. One of the most appealing aspects of this feature is application of this medicament in management of common respiratory tract infections.

Hajj is an Islamic ceremony as one of the most important religious rituals of Muslim nation that brings millions of them together from different geographical locations in a compact area, Mecca. In this population each individual could be come up from a different social, cultural, and medical background, so obviously there is big chance for spread of contagious multi-microbial respiratory tract infections (RTIs). Acute respiratory infection has been announced as the leading cause of admission to Saudi hospitals during the Hajj [1]. An estimation of 1 in 3 pilgrims would experience flu-like symptoms generally on terminal phases of this ritual and afterwards on re-entrance to homelands [2]. Therefore any measure to control the disease will be highly useful in decreasing morbidity or even mortality caused by this etiology. Considering these facts it could be hypothetically proposed that supplementation with Echinacea would be beneficial in improving health-care in this crowded situation by inhibiting development and consequently dissemination of respiratory tract infections.

In this review we tried to provide and process more scientific evidence on this issue in order to clarify potential benefits of Echinacea products in Hajj pilgrims for design of the future randomized clinical trials.

2. Methods

In order to find the most relevant scientific data about the potential benefits of Echinacea products in management of airway infections in Hajj pilgrims, we systematically explored an accredited database, PubMed, with Mesh terms of “Echinacea” and “Respiratory Tract Infections” as major topics without any limitation for time or language. Some of studies with repeated concepts omitted and some added to further explain the topics.

3. Results

A total number of 100 journal articles were found using the search order: (“Echinacea” [Majr]) and “Respiratory Tract Infections” [Majr], including 20 clinical trials, 20 reviews, and one case report. At the end some high rank relevant articles added and finally 66 journal articles were used in this review.

4. Discussion

4.1. Immune-modulatory effect of Echinacea

There are many herbal and food supplements with immune-modulatory and antimicrobial effects [3,4]. Accordingly there are lots of different Echinacea products known with different names used for this purpose. It has been proposed that purple coneflower pressed juice preparations can induce the innate immune system stimulation and increase the resistance to common colds. Modulation of monokine secretion has a major role in this process [5]. Echinilin is a standardized formulation of Echinacea by active ingredients including alkamides, cichoric acid and polysaccharides, shown to be effective for treatment of common cold. Further examinations revealed that these effects were the results of enhancement of non-specific immune response and free radical scavenging. At first increased number of circulating total white blood cells, monocytes, neutrophils and NK cells and then suppression of the cold-related surge in superoxide production by the neutrophils were involved in this process [6]. Unsaturated N-alkylamide lipids introduced to be the main constituent of Echinacea preparations. These compounds have potential anti-

inflammatory and immune modulatory effects via activation of cannabinoid receptor type-2. Measuring cytokine expression from human peripheral blood mononuclear cells showed stimulation of anti-inflammatory cytokine IL-10 and suppression of pro-inflammatory TNF-alpha therefore a pleiotropic effect proposed for extracts of such plants [7]. In a study in 2012, Polinacea, a standardized extract from roots of Echinacea angustifolia including complex polysaccharide IDN5405 and phenylethanoid echinacoside with low alkamides evaluated for synergistic immune stimulation of influenza vaccine with encouraging results [8].

Considering these observations, it could be stated that single ingredients of Echinacea extract can have immune boosting effects both separately and synergistically in combination.

Beside systemic responses, also local immune effect has been shown on oral cavity mucosa by measuring s-IgA concentrations in saliva. Echinacea can decrease mucosal immune suppression after exercise and duration of upper respiratory tract infections (URI) [9].

4.2. Echinacea for respiratory tract infections

Numerous studies have evaluated the efficacy of Echinacea products in RTIs [10,11].

In a preliminary animal study, symptoms of chronic and seasonal URIs significantly relieved with acceptable tolerability by Echinacea as an alternative treatment [12].

Human data for efficacy of Echinacea is not so straight forward. In 2005 in a secondary analysis of a previously studied population with disappointing results for treatment, Echinacea purpurea, shown to be effective in reducing the risk of subsequent URI after the primary cold episodes in follow-ups. A total of 524 children were enrolled in the study. Therapy caused 28% decrease in risk of subsequent URI, although this finding required to be tested in specifically designed URI prevention trials [13,14].

4.3. Echinacea for common cold

The main focus of the majority of journal articles about anti-infective effects of Echinacea in RTIs is prevention and treatment of common cold. Considering the fact that a heterogeneous spectrum of etiologies and pathologies are included in this complication, a great similarity could be found in Hajj-related respiratory infections.

Cold “prophylaxis” is one of the most desirable outcomes of supplementation with Echinacea in different trials and clinical settings. Several studies suggested that Echinacea can effectively prevent upper respiratory tract infections [13]. In a recent review of such trials by Karsch-Völk et al. an association has been proposed between consumption of Echinacea products and decrease of cold incidence [15].

Data for “treatment” of respiratory tract infections is also prevalent. In a randomized, double-blind, placebo-controlled clinical trial with the goal to confirm unproven benefits of Echinacea, 80 adult patients with first signs of a common cold were recruited. The median time of illness decreased significantly with more rapid alleviation of symptoms while the product was well tolerated [16]. In another randomized, double-blind, placebo-controlled trial, reduction of the severity and duration of symptoms of a naturally acquired common cold was evaluated in 282 subjects. Echinacea was started with 10 doses at the onset of the first cold-related symptom on the first day and continued with four doses per day for 7 days. Echinacea reduced symptom severity, significantly [17].

Accordingly two meta-analyses suggested that Echinacea supplements are effective in the management of common cold with decreasing development and duration, compared with placebo but further well-designed clinical studies have been recommended for

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