

# Review of Herbal Products for Treating Common Cold

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## Introduction

Have you ever had symptoms of roughness or soreness of the throat, development of nasal discharge, sneezing, and irritation of the upper respiratory tract before? Well, most people in the world have and those are the classic symptoms of the common cold. The common cold is an infection of the upper respiratory tract (URT) caused by approximately more than 200 different viruses. In 2004, the United States Census Bureau, International Data Base reported that approximately 1 billion of cold cases are reported each year, mostly affecting children. In Malaysia, the extrapolated incidence of the common cold in 2004 almost reaches 5.5 million cases. The next question that has been around for hundreds of years is whether or not there is a cure. We have certainly come very far in treating the condition. Over-the-counter (OTC) medications, as well as nutritional supplements and herbal medicines can alleviate symptoms and sometimes shorten the duration of infection. However, because colds and the flu are caused by viruses, they have no real cures. The role of herbal medicines in treating the common cold has been a massive topic discussed worldwide and the emerging use of these remedies with the evidence to support and against their uses will be discussed further in this review.

## Objective

The use of herbal medicine in treating common colds is widespread but yet controversial. So far, there are at least more than 20 herbs have been identified to have potential beneficial effect in treating common cold. The aim of this review is to provide updated evidence regarding the use of these remedies.

## Methods

The search for relevant articles related to herbal medicines use in common cold began in the OVID database. Under the subject heading "Common cold", 2115 articles were obtained. The next search was done using the subject heading "Herbal medicine". Under this umbrella term, 454 articles were obtained. Then, the two search terms were combined to yield more specific results. As a result, 4 articles were obtained but only one was relevant to the topic discusses. OVID database was also used as a search tool for more specific herbs such as Echinacea, ginger, garlic, goldenseal and ginkgo.

The search was continued using the National Library of Medicine-owned Pudmed database. Using the same subject headings and combination, the search yielded 11 articles. Searches were also done for specific type of herbs as in the previous search by the OVID database.

ScienceDirect was also used as a search tool to locate articles related to this topic. Search terms used include "common cold", "immune system", and "herbal medicine". The search yielded hundreds of full-text articles but most of them are animal studies. However, some of these studies are still accepted as references since they provide proven scientific evidence for the herbal medicines.

Throughout the search process, only articles written in English, and published not more than 10 years (1995-2005), were accepted. Some of the abstracts were accepted

because of the current information they provided and some articles which involved studies in animals were also accepted because they provide preliminary data on herbal medicines related to this topic.

## Literature review

This literature reviews will focus on evidence-based use of herbal medicines in common cold. The review will address each common herb or plant with the evidence to support and against their uses separately. Echinacea will be the focus of this review since it is the most extensively studied herb for common cold. Herbs without any evidence to support its use will be discussed in another subheading. This review will also discuss the role of pharmacists in use of herbal medicines in general, and specifically for common cold. The implication of use of the herbals to pharmacy practice will be discussed in the final section.

## ECHINACEA

### At a glance

Echinacea played an important role in Native American (Giles et al., 2000) and it has been used for centuries. This is not an argument for efficacy, but it does indicate some degree of safety. The plant is grown in the central and eastern United States and is cultivated in Europe (Percival 2000, Barrett et al., 2004).

Common names are American coneflower, black Susan, purple coneflower, and narrow-leafed coneflower (Giles et al., 2000). Extracts of Echinacea contain varying concentrations of flavonoids, polysaccharides, derivatives of caffeic acid, polyacetylenes, alkylamides, and alkaloids (Erickson 2001). These compounds were commonly prescribed until the introduction of sulfa drugs in the 1930s (Giles et al., 2000). Types of Echinacea commonly used are *E. purpurea*, *E. pallida*, and *E. angustifolia*. Both the plant's upper parts and roots are used (Islam and Carter 2005). *E. angustifolia* has long been considered to have the greatest immunostimulating activity but as *E. purpurea* is the easiest to grow commercially and it has become the most used species in the United States (Giles et al., 2000). Echinacea is best known for its effects on immune system (Barrett 2003) but in general, the herb is used for treating the common cold, coughs, bronchitis, and inflammation of the mouth and pharynx (Percival SS 2000, Barrett et al., 2004). Powers (2004) reported that Echinacea could also be used for wound healing. Herbal texts list the use of Echinacea by at least 13 tribes of Native Americans for the treatment of very widely diverse conditions as sore mouth and gums, cough, dyspepsia, toothache, bowel complaints, hydrophobia, and snakebite (Sampson W 2005). However, until now there is no clear consensus about whether or not Echinacea can benefit human health (Barrett et al., 2002, Ohara et al., 1998) and also lack of safety and efficacy data in children (Barrett 2004, Taylor et al., 2003). On the other hand, there are also no published data to support contraindications of its use (Andrea et al., 2005).

#### Evidence supporting its use

A study was done to verify the efficacy and safety of an herbal medication containing an extract of a mixture of *Baptisia tinctoriae radix*, *Echinaceae pallidae/purpureae radix* and *Thujae occidentalis herba* (SB-TOX) in the treatment of upper respiratory tract infections. A total of 91 adults (mean age 42.1±13.0 years) were randomized to receive 19.2 mg of SB-TOX (n=31), 9.6 mg SB-TOX (n=29) or placebo (n=31) three times daily for 3–12 days. Since a “running nose” is the main symptom of a common cold, the total number of facial tissues used throughout the clinical duration of their cold was the primary efficacy parameter. No adverse events were reported. This study confirms the efficacy and safety of the herbal remedy in the treatment of the common cold. Patients recover more rapidly, within just a few days, and the effect was dose-dependent. Even the highest dosage did not produce any safety concerns. Based on these results and overall, it is recommended that treatment is initiated as soon as possible after symptom onset and with a high dose (Naser et al 2005).

Goel et al (2004) test the efficacy of a highly standardized formulation Echnilin (a formulation containing alkamides, cichoric acid, and polysaccharides from freshly harvested *Echinacea purpurea* plants) in reducing

the severity and duration of symptoms of common cold. In this randomized, double-blind, placebo-controlled trial involving 282 subjects aged 18-65 years, the total daily symptom scores were found to be 23.1% lower in the Echinacea group than in placebo in those who followed all elements of the study protocol (P<0.01). Therefore, the study concluded that early intervention with a standardized formulation of Echinacea resulted in reduced symptom severity in subjects with naturally acquired upper respiratory tract infection.

A review article compiling clinical trials on Echinacea from 1966-1999 concluded that the efficacy of Echinacea for treating common cold symptoms remains unclear, yet it appears to be a safe alternative for suitable patients. Echinacea appears to be well tolerated with a low frequency of adverse effects, such as mild dyspepsia, headache, and dizziness. In human and animal experiments, preparations given orally or parenterally produced immunostimulating effects such as increased white blood cells count, activation of phagocytosis and elevation of body temperature. Other actions are antiviral, antiinflammatory, and antibacterial properties, which were consistently reported from in vitro experiments. Echinacea appears to be well tolerated with a low frequency of adverse effects, such as mild dyspepsia, headache, and dizziness (Giles 2000). From studies in the English language, it is uncertain which part of the plant (root, aerial portion), of which species (*E. purpurea*, *E. angustifolia*, *E. pallida*), in which formulation (squeezed sap, hydroalcoholic extract, dried powder extract, etc.) offers the most evidence for efficacy (Giles et al., 2000).

Another review article published in the same year also concluded that Echinacea is indeed effective in reducing the duration and severity of symptoms, but that this effect is noted only with certain preparations (Percival 2000).

#### Evidence against its use

Grimm and Muller (1999) concluded in their randomized-controlled trial, that treatment with fluid extract of *Echinacea purpurea* did not significantly decrease the incidence, duration or severity of colds and respiratory infections compared to placebo. Results from the 8-week period found no significant differences between treatment groups in the number of infections in each category of severity determined by the investigators. Side effects were observed in 11 patients (20%) of the Echinacea group and in seven patients (13%) of the placebo group (p = 0.44).

Barrett et al. (2002) assessed the efficacy of dried, encapsulated, whole-plant Echinacea preparation as an early treatment for the common cold, in a community-based trial involving 148 subjects. This randomized-controlled trial involved the use of an encapsulated mixture of unrefined *Echinacea purpurea* herb (25%) and root (25%) and *E. angustifolia* root (50%) taken in 1-g doses six times on the first day of illness and three times on each

subsequent day of illness for a maximum of 10 days. The primary measurements are severity and duration of self-reported symptoms of upper respiratory tract infection. The study found that Echinacea preparations provided no detectable benefit or harm.

In another randomized, placebo-controlled trial, the effects of pressed juice of the above-ground plant parts of *E. purpurea* were studied. The juice was administered for 7 days before and after RV-39 inoculation, on rhinovirus colds. The results of the study suggest that Echinacea was not effective for preventing rhinovirus infection as defined by laboratory criteria. Among those who were infected and receiving Echinacea, there was a trend toward reduction in the number of clinical colds, compared with those who were infected and received placebo (59% vs. 86%;  $p = 0.0883$ ) (Sperber SJ et al. 2004).

Barrett (2004) runs an investigation to determine if *Echinacea purpurea* is effective in reducing the duration and/or severity of URI symptoms in children and to assess its safety in this population. The main outcome measures were duration and severity of symptoms and adverse events recorded by parents. There was no difference observed in the duration between URIs treated with Echinacea or placebo ( $p = 0.89$ ). The only difference detected in the study was in the occurrence of rash in which 7.1% of the subjects treated with Echinacea developed rash compared to 2.7% of those treated with placebo ( $p = 0.008$ ). Therefore, the study concluded that Echinacea purpurea was not effective in treating URI symptoms in patients 2 to 11 years old, and its use was associated with an increased risk of rash. The same study was done by Taylor et al. (2003) and found similar results.

A randomized-controlled trial tested a standardized dose of *E. purpurea*, prepared from the aerial portion of the plant, for effectiveness at reducing the severity of symptoms and the duration of the common cold when treatment is started within 24 hours of the onset of cold symptoms. Symptoms (sneezing, nasal discharge, nasal congestion, headache, sore or scratchy throat, hoarseness, muscle aches, and cough) were scored subjectively by the patient and recorded daily in a diary. This study failed to show that Echinacea effectively reduces the symptoms and duration of the common cold. No statistically significant difference was observed between treatment groups for either total symptom scores ( $p$  range, 0.29–0.90) or mean individual symptom scores ( $p$  range, 0.09–0.93). The time to resolution of symptoms was not statistically different ( $p = 0.73$ ) (Yale and Liu 2004).

The most recent study on Echinacea was done by Turner and colleagues (2005). These investigators performed a randomized prospective study to evaluate the effect of chemically defined extracts from *E. angustifolia* roots on rhinovirus infection. The results of this study indicate that extracts of *E. angustifolia* root, either alone or in

combination, do not have clinically significant effects on infection with a rhinovirus or on the clinical illness that results from it. There were no statistically significant effects of the three Echinacea extracts on rates of infection or severity of symptoms.

The most current systematic review by the Cochrane Database was done to assess the effects of preparations containing extracts of Echinacea in the prevention and treatment of the common cold. Majority of the available studies report positive results. However there is not enough evidence to recommend a specific Echinacea product, or Echinacea preparations for the treatment or prevention of common colds (Melchart et al., 2005). The result from the Cochrane Database Review was supported by other review articles which concluded that Echinacea use cannot be recommended due to a lack of standard product, variability in dose, and variability in outcome measures (Islam and Carter 2005, Fugh-Berman 2003). Fugh-Berman (2003) also concluded that the use of Echinacea to prevent URIs should be discouraged due to occurrence of severe adverse effects such as anaphylaxis, acute asthma, and urticaria/angioedema. Besides that, there is also a risk for hepatotoxicity (Bielory 2004).

### Conclusion

Although the use of Echinacea is very common especially among Western populations to treat the common cold, but the evidence exists so far clearly favors the opposite. There is more evidence against than those supporting its use for common cold. Furthermore as reported by the systematic reviews, studies were done using different formulations, different parts of the plants and with different doses. Therefore, the use of Echinacea either to treat or to prevent the common cold cannot be recommended especially by pharmacist until there is clear and conclusive evidence to support its use.

### GARLIC

#### A brief introduction

Garlic, *Allium sativum*, has been consumed as a spice and also as a medicine for thousands of years all over the world. In ancient Egypt, garlic was consumed to treat diarrhea. In ancient Greece, it was consumed to treat intestinal and lung disorders (Sato and Miyata 2000). In Asia, it has been a remedy to treat common cold, fever, and sore throat. Garlic also has claimed to possess antimicrobial, antineoplastic, anticardiovascular, immuno-stimulatory and hypoglycemic properties (Sato and Miyata 2000). Garlic's historic and worldwide medicinal use has made it one of the most extensively studied medicinal herbs. Nevertheless, the actual therapeutic benefits of this member of the Liliaceae family are unclear (O'hara et al., 1998). There is also very little known about the actual safety profile of garlic. Kao et al. (2004) discovered the garlic allergen which contributes to hypersensitivity reactions.

**Evidence supporting its use**

A double-blind, placebo-controlled survey by Josling (2001) was designed to determine whether a unique garlic supplement that contains only stabilized allicin could prevent colds in healthy volunteers. One hundred forty-six volunteers were randomized to receive a placebo or an allicin-containing garlic supplement, one capsule daily, over a 12-week period. They used a five-point scale to assess their health and recorded any common cold infections and symptoms in a daily diary. The group receiving garlic supplement had significantly fewer colds than the placebo group (24 vs 65,  $p < 0.001$ ) with shorter duration of symptoms (1.52 vs 5.01 days,  $p < 0.001$ ). Consequently, volunteers in the active group were less likely to get a cold and recovered faster if infected. Volunteers taking placebo were much more likely to get more than one cold over the treatment period. The study concluded that an allicin-containing supplement can prevent attack by the common cold virus. However, there is very little known about the actual safety profile of garlic (Kao et al., 2004).

**Evidence against its use**

No study available

**Conclusion**

Although garlic has been used for the treatment of a wide range of medical conditions, it is most commonly linked to the prevention and treatment of hyperlipidemia and coronary heart disease (Andrea et al., 2005). There are no studies available to suggest the effectiveness of garlic to treat common cold. Therefore, from available data, we can only suggest the use of commercially-available garlic to prevent common cold but for treatment.

**OTHER HERBS****GINSENG**

Ginseng is one of the most popular and expensive herbs in the world. At least six million Americans use the root (O'hara et al., 1998). It is derived from the roots of several plants. One of the most commonly used and researched of the ginsengs is *Panax ginseng*, also called Asian or Korean ginseng. The main active components of *Panax ginseng* are ginsenosides, which have been shown to have a variety of beneficial effects, including anti-inflammatory, antioxidant, and anticancer effects. Results of clinical research studies demonstrate that *Panax ginseng* may improve psychologic function, immune function, and conditions associated with diabetes (Kiefer and Pantuso 2003).

Because of the use of combination products and the limitations of some studies on ginseng (e.g., poor methodologic quality, research focusing on healthy volunteers, small sample size, unstandardized ginseng preparations, varying doses), it is difficult to draw

conclusions about some of the clinical effects of ginseng (Kiefer and Pantuso 2003).

**GOLDENSEAL**

Goldenseal is also known as *Hydrastis Canadensis*. The root of goldenseal is believed to help chronic inflammation of the mucous membranes, such as those lining the throat, sinuses, and lungs.

One clinical trial investigated the antigen-specific in vivo immunomodulatory potential of continuous treatment with Echinacea and goldenseal root extract over a period of six weeks using rats. Results from this study suggest that Echinacea or goldenseal may enhance immune function by increasing antigen-specific immunoglobulin production (Rehmann et al., 1999).

**GINGER**

Ginger (*Zingiber officinale*) has a long history of medicinal use. It is one of the best-known medicinal herbs in China and Japan, where it has commonly been prescribed for head-aches, nausea and other stomach problems, and colds. The rhizome is the part used for culinary and medicinal purposes. Commercial varieties of ginger are usually described in relation to their geographic origin. Commonly found in Southeast Asia, India, Africa, and the West Indies, this herb can be cultivated in other areas with proper growing conditions (Grant 2000). In laboratory animals, the gingerols have analgesic, sedative, antipyretic, antibacterial, and GI tract motility effects (O'hara et al., 1998).

**MA-HUANG**

Ma-Huang is a traditional oriental herbal medicine frequently used for the treatment of the common cold in Japan. A study by Takagi et al. (2004) investigated the effects of Ma-Huang administration on influenza in mice. Results from this study showed that Ma-Huang suppresses the proliferation of influenza virus in the lungs and suppresses the discharge of the virus from the upper respiratory tract. From these results, the study concluded that Ma-Huang is effective in controlling the infectious expansion of the influenza virus.

**ANDROGRAPHIS PANICULATA**

*Andrographis paniculata* is an annual herbaceous plant, widely found in tropical and subtropical Asia, Southeast Asia, and India. The plant is one of the most important medicinal plants used in traditional Chinese and ayurvedic medicine for the treatment of the common cold, influenza, and other infectious diseases. It has been used extensively in Scandinavia for the past 20 years for the treatment and prevention of the common cold (Andrea et al., 2005).

A double blind, placebo-controlled, parallel-group clinical study was carried out to evaluate the effect of an *Andrographis paniculata* extract in the treatment of acute upper respiratory tract infections, including sinusitis. Temperature, headache, muscle aches, throat symptoms, cough, nasal symptoms, general malaise and eye symptoms were taken as outcome measures with given scores. The study concluded that *Andrographis paniculata* has a positive effect in the treatment of acute upper respiratory tract infections and also relieves the inflammatory symptoms of sinusitis (Gabrielian et al., 2002).

A very recent systematic review was done to assess the efficacy of *Andrographis paniculata* in the symptomatic treatment of uncomplicated upper respiratory tract infection. The review reported a significant difference in effects and in symptom severity score when compared with placebo ( $p < 0.0001$  and  $p = 0.0002$  respectively). Therefore the review concluded that *Andrographis paniculata* extract may be more effective than placebo and may be an appropriate alternative treatment of uncomplicated acute upper respiratory tract infection (Poolsup et al., 2004).

## ASTRAGALUS

In the United States and China, the root of astragalus has been shown to increase nearly every phase of immune-system activity. One study showed that long-term use (35 days) heightened immune-cell activity. Another showed that astragalus increases the production and storage of interferon which stimulates cells to begin their defense in fighting illnesses such as the common cold (Block and Mean 2003).

## Conclusion

Ginseng, goldenseal, ginger, Ma-Huang, *Andrographis paniculata*, and astragalus have all been used to treat the symptoms of common cold. Besides these herbs, other herbs such as Anise (*Pimpinella anisum*), Elderberry (*Sambucus nigra*), Licorice (*Glycyrrhiza glabra*), Marsh mallow (*Althaea officinalis*), Mullein (*Verbascum thapsis*), Osha (*Lomatium dissectum*), Pennyroyal (*Hedeoma oblongifolium*), Purslane (*Portulaca oleracea*), Slippery Elm (*Ulmus rubra*), and Stinging nettle (*Urtica dioica*) have also been used (www.herbmed.org). These remedies are claimed to have activities of the expectorants, decongestants, antitussive, and immunomodulators. Like the other herbs, all these herbs have not been studied, specifically in treatment for the common cold. Most of them are being studied for other conditions. Ginger, for example, is very well studied for prevention of cancer and for hypertension. With the current information that we have, there is no reason to support the use of any of these herbal medicines to treat the common cold.

## SUMMARY

Herbal medicines are generally considered comparably safe. However, severe side effects and interactions with other herbs or drugs have been reported (Klaus L et al. 2001). Echinacea for example, has been associated with anaphylactic reaction, exacerbation of allergic asthma, and atopic dermatitis. Although some of these herbal remedies have been used for thousands of years, we still do not have the data on how effective and how safe they are. In third world countries including Malaysia, many people still believe that herbs are the answers to many diseases but all that we have been hearing so far are the benefits of those herbs. How about the side effects of those herbs? Have anybody died from it? If yes, then was it ever reported? That is why it is very difficult to study these traditional medicines. People or users tend to relate the use of these herbs only to their effectiveness, but not to their toxicity. Thank to science and emergence of new knowledge in this field, we hopefully will be able to give definite answers to all these questions.

## Roles of pharmacists in the use of herbal medicines for common cold

- 1. Gather adequate knowledge about herbal medicines**  
Pharmacists should equip themselves with the latest knowledge and information on herbal medicines. In Malaysia, for example, there are training courses available on herbal medicine in which pharmacists can participate to acquire new knowledge in this field. Pharmacists should also be able to identify the sources of information on herbs. Being able to choose the correct source of information is also a key in order to differentiate between facts and personal opinions. For example, knowledge about herbals for common cold are readily available on the internet but pharmacists must be able to choose a reputable website with evidence-based information.
- 2. Educate patients on the efficacy and safety of herbal medicines**  
Pharmacists should educate patients or users on the efficacy and safety of herbal medicines. Education can be delivered in a form of verbal counseling, or written information. Counseling can be done for an individual or a group of patients. Pharmacists should be able to provide information on the dosage, correct route of administration, and the duration of use. Potential interactions with other herbs or with other medications should also be emphasized. Opportunities to educate patients on use of these herbs in common cold should not be a problem because the condition is very common.
- 3. Provide appropriate suggestions or recommendations to public regarding the use of herbal medicines**  
Recommendations may include not taking any of

the herbal medicines. If the patient insists, then at least precautions have been told. Before making any recommendation for use, pharmacists should know patient's background especially the medication history. This is because some of the herbals may interact or have additive/synergistic effect on other medications the patient is taking or they may worsen the patient's condition. For example, if the patient is on a decongestant for runny nose, then a herb with known antihistaminic properties would not be appropriate. Similarly, if the patient has history of hypertension, pharmacists should not recommend herbs with known antihypertensive activity because the patient might already be on an antihypertensive medication.

#### 4. **Control the sales of herbal medicines**

Community pharmacists should control the sale of herbal products to public. Pharmacists should only sell herbal products with known evidence to support their use. The National Pharmaceutical Bureau should also play a role in controlling the sales of herbal products. This is because there are now many herbal products with added constituents that can harm the consumers.

#### 5. **Participate in or perform studies on herbal medicines**

Pharmacists should actively involve in studies on herbal medicines because we are the only professional who receive formal knowledge in the field. Most studies lack the application of pharmacokinetics and pharmacodynamics principles which are vital in studying the effect of xenobiotics. By participating in these types of studies, pharmacists may be able to improve some methodological weaknesses in current studies and provide more convincing results.

#### **Implications of this review to pharmacy practice**

This review alerts pharmacists to be more cautious and well-versed when recommending the use of herbal medicines for common cold. At least for now, we know that there is no single herbal product found to be beyond doubt, effective to treat or prevent the common cold. Pharmacists should take this opportunity to educate the public so that they are more well-informed and able to make the correct decisions.

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