

Role of *Echinacea purpurea* for COPD management –A Mini Review

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Abstract: Extracts of *Echinacea purpurea* (EP, purple coneflower) have been used traditionally in North America for the treatment of various types of infections and wounds, and have become popular herbal medicines. Recent studies have revealed that certain standardized preparations contain potent and selective antiviral and antimicrobial activities. Chronic Obstructive Pulmonary Disease (COPD) makes it hard to breathe. Coughing up mucus is often the first sign of COPD. In COPD, the airways and air sacs lose their shape and become floppy. Cigarette smoking is the most common cause of COPD. Breathing in other kinds of irritants, like pollution, dust or chemicals, may also cause or contribute to COPD. The aim of the article is to emphasize the beneficial effects of *Echinacea purpurea* in COPD management.

Keywords: COPD, *Echinacea purpurea*, natural remedies, management.

Introduction

Upper respiratory tract infections including nasopharyngitis, pharyngitis, tonsillitis and otitis media constitute 87.5% of the total accounts of respiratory infections. The majority of acute upper respiratory tract infections are caused by viruses.

Chronic obstructive pulmonary disease (COPD) is a progressive disease making it hard to breathe. COPD can cause coughing that produces large amounts of mucus, wheezing, shortness of breath, chest tightness, and other symptoms.⁽¹⁾

Pathophysiology-The main cause of COPD is smoking but other exposures may be of importance. Exposure leads to airway inflammation in which a variety of cells are involved. Besides neutrophil granulocytes, macrophages and lymphocytes, airway epithelial cells are also of particular importance in the inflammatory process and in the development of emphysema.

Cell trafficking orchestrated by chemokines and other chemoattractants, the proteinase-antiproteinase system, oxidative stress and airway remodelling are central processes associated with the development of COPD⁽²⁾

Echinacea purpurea is used for centuries to boost the immune system, to prevent upper respiratory infections related to the flu and common cold, reduce swollen lymph glands. The source material for scientific and clinical studies is usually an aqueous "Squeezed juice" or ethanol tincture/extract of aerial parts of the dried plant or roots.

The chemical composition differs substantially between such preparations, at least in terms of the known “marker compounds”, such as caffeic acid derivatives, alkylamides, and polysaccharides, all of which have been claimed to contribute to the medicinal benefits^[3]

Therapeutic uses

- Prevents cold and flu.
- Enhance immune system to help fight infection.
- Less commonly used topically for wounds and other skin problems.

Common Side Effects⁽⁴⁾

- Side effects are uncommon. When side effects do occur, they are usually related to common, gastro intestinal symptoms.
- Can cause allergic reactions including rash, increased asthma symptoms and anaphylaxis
- People are more likely to have an allergic reaction if they are sensitive to plants in the daisy family.
- People with asthma or atopy are more likely to have an allergic reaction to echinacea.

COPD management

Chronic Obstructive Pulmonary Disease is now the fourth leading cause of death after cancer, heart attack and stroke. Although there is no cure treatment measures can be included. Other pharmacological methods are use of bronchodilators like theophylline and anti inflammatory drugs like corticosteroids, these are most effective when inhaled.

Mucolytics like Guaifenesin and potassium iodide are taken orally.in special cases antibiotics are used to treat acute exacerbations.

Oxygen therapy shows to improve survival along with adequate exercise which helps in pulmonary rehabilitation. In some patients surgery for lung volume reduction can help reduce emphysema.⁽⁵⁾

General treatment measures for COPD: ⁽⁶⁾

- Smoking cessation to reduce lung function decline.
- Chronic medication like bronchodilators, inhaled corticosteroids and oxygen therapy.
- Pulmonary rehabilitation for patients with functional impairment.
- Surgical therapy options including bullectomy, lung volume reduction surgery and lung transplantation.
- Palliative care should be discussed with patients requiring less aggressive therapy.

Literature survey

a) Human model

A double-blind, randomized, placebo-controlled trial in COPD patients with acute URTI was conducted to determine whether *Echinacea purpurea* (EP) along with micronutrients may alleviate COPD exacerbations caused by acute URTI. Study reveals the combination of EP, zinc, selenium and vitamin C may alleviate exacerbation symptoms caused by URTI in COPD. Further studies are warranted to investigate the interactions among *Echinacea*, zinc, selenium and vitamin C.⁽⁷⁾

b) Animal model

Echinacea purpurea(EP)-treated rats were assessed for spleen and lung macrophage-related functions, including phagocytic activity and cytokine stimulation, both of which were stimulated in the treated animals ^[8], in agreement with the studies on mouse cells cultured in vitro.

In the studies with EP polysaccharides derived from plant cultures, treated normal and immunosuppressed mice could be protected from a lethal dose of either *Listeria monocytogenes* or *Candida albicans*, apparently as a result of reduced titers of the organisms in target tissues . A similar beneficial effect of standard EP extract was also observed in a recent study in which mice were infected with *Listeria monocytogenes* ^[9]. Whether the protection in these cases was due to enhanced phagocytic activity and clearance of the organisms in various tissues, or to direct contact of EP components with the organisms, or a combination of these and other factors, is not clear. ⁽¹⁰⁾

Conclusion

The studies on *Echinacea* indicate its multiple actions either individually or in synergism.the resulting benefits are: direct virucidal activity/activities against several viruses involved in respiratory infections, at concentrations which are not cytotoxic ;reversal of the proinflammatory response of epithelial cells and tissues to various viruses and bacteria; modulation of certain immune cell functions; reversal of the excessive mucin secretion induced by rhinovirus.

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