



VAPOR PATCH: A DISRUPTION IN DRUG DELIVERY FOR RELIEVING CONGESTION

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<https://doi.org/10.46607/iamj02p7012022>

(Published Online: November 2022)

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Article Received: 19/08/2022 - Peer Reviewed: 18/09/2022 - Accepted for Publication: 26/12/2022



ABSTRACT

Respiratory tract infections are increasing with the increase in pollution. The most common upper respiratory tract infections include the common cold and cough. These symptoms may interfere with regular activities and decrease the quality of life of an individual. A vapor patch is a newer approach to nasal inhalation. A vapor patch is a safe, convenient, and a hand's free inhaler. Bibo clear vapour patch ultra ® contains the herbal extracts of *Mentha piperita* (Menthol), *Eucalyptus globulus* (Eucalyptus), *Thymus vulgaris* (Thyme), and *Cinnamomum camphora*. These herbal extracts are beneficial in dealing with symptoms of the common cold, cough, sinusitis, and other respiratory conditions. The essential oils from these herbs are suitable for inhalation and topical application.

Key words: Vapor patch, Inhaler, *Mentha piperita*, Menthol, *Thymus vulgaris*, Thyme, *Cinnamomum camphora*, Camphor, *Eucalyptus globulus*, Nasal congestion

INTRODUCTION

An inhaler is very popular and relieves the symptoms of a cold. People have been using inhalers for a long

time. However, it is messy to hold an inhaler in one hand

There is an increased chance of spreading infection if multiple people use the same inhaler. Also, some people may not be comfortable taking it in public places.

On the other side, vapour rubs are also popular as decongestants. But most vapor rubs from well-known brands contain petroleum jelly, which is harmful to children and adults on chronic use. There are reported cases of lipoid pneumonia in kids and adults due to excessive use of petroleum jelly-based vapor rubs [1-4]. Lipoid pneumonia is a rare form of pneumonia. It is caused by inhaling or aspirating fat-containing substances like mineral oils, petroleum jelly, laxatives, etc. It may show symptoms like shortness of breath and cough. It may also be caused by acute inhalation when the amount of mineral oil is too large. Lipoid pneumonia doesn't have any specific or characteristic radiological or clinical features. Therefore, awareness of such conditions becomes very important [5]. Vapor rubs are also very messy to use and can cause eye irritation. Many people apply these vapor rubs directly into nasal areas or use them for steam inhalation, which may directly lead to inhaling the petroleum jelly present in them.

A vapor patch is a novel approach to respiratory health and a better alternative to vapor rubs and inhalers.

A vapor patch is an easy, safe, convenient, and hand's free inhaler. It can be applied directly on the outer clothing, pillow, car steering, etc., for relieving blocked or runny nose, sneezing, and get clear breathing. It is safe for kids as it is free from harmful chemicals and petroleum jelly. It can provide relief for up to 10 hours.

1. A NOVEL APPROACH: VAPOR PATCH

A Vapor patch is a novel and potentially better approach than inhalers and balms. It is an easy-to-use and effective "hand's free inhaler". Bibo clear vapor patch ultra® is India's first vapor patch that is safe for adults and kids as it is free from petroleum jelly. This vapor patch contains extracts of herbs like *Mentha piperita* (menthol), *Thymus vulgaris* (thymol), *Cinnamomum camphora* (camphor), and *Eucalyptus globulus* (eucalyptus oil).

1.1. Mentha piperita

Mentha piperita (peppermint) belongs to the family



Lamiaceae, which is one of the most aromatic plant species. *M. piperita* shows medicinal effects such as antifungal,

antiviral, anti-inflammatory, antiallergic, and anti-cancer properties. Due to these properties, peppermint leaves can relieve the common cold and inflammation of the mouth & respiratory tract.

The species of *Mentha* herb are rich in polyphenols and contain caffeic acid and its derivatives like caftaric acid, cinnamic acid, ferulic acid, and oleanolic acid. This herb contains flavonoids like luteolin and its derivatives, apigenin, acacetin, thymonin, diosmin, and salvigenin. Among all the phytochemicals present, the essential oils of *Mentha piperita* play an important role in improving respiratory conditions. The phytochemicals derived from the mint family also show anticancer properties against different human cancers such as cervix, lung, breast cancer, and a few more [6]. According to a study, the leaf extracts of *M. piperita* L. revealed good antibacterial action against Gram-positive bacteria like *Staphylococcus aureus* and *Bacillus subtilis* than Gram-negative *Escherichia coli*. These bacteria are likely to cause respiratory infections such as pneumonia [7].

Various in-vitro studies show that peppermint oil acts as a smooth muscle relaxant. The species contain high levels of antioxidants, including phenolic compounds, ascorbic acid, and carotenoids. The phenolic compounds show free radical scavenging properties, which may help reduce inflammation [7].

Thymus vulgaris



Thymus vulgaris or Thyme is known as "garden thyme" and belongs to the family *Lamiaceae*. In the Greek lan-

guage, the word thyme means "to fumigate".

Thyme has been in use for centuries for its medicinal properties. It shows antioxidant, anti-inflammatory, analgesic, expectorant, antibacterial, antiviral, antifungal, antiseptic, antispasmodic, and carminative properties. The phytochemicals present are terpenoids, flavonoids, phenolic acids, and glycosides. Due to its anti-inflammatory properties, Thyme relieves respiratory conditions such as whooping cough, bronchitis, asthma, sinusitis, and catarrh.

Thyme consumption before and after meals was popular in the ancient Roman era due to its properties as an antidote (treatment for poisoning). Thyme was a preferred herb for bathing due to its antidote property. According to studies, Thyme has shown antidote properties due to the presence of thymol and carvacrol.

Various phytochemical analysis studies reveal the presence of carvacrol and γ -terpinene which shows anti-inflammatory and antiviral properties. These properties help manage conditions like colds, sore throat, bronchitis, asthma, whooping cough, pharyngitis, and other respiratory tract infections^[8-9].

Cinnamomum camphora

Cinnamomum camphora, also known as the camphor tree, belongs to the family *Lauraceae*.



Camphor is one of the ingredients in many formula-

tions such as creams, balms, and oils due to its medicinal properties. Camphor shows analgesic, anti-inflammatory, anti-infective, antiseptic, antispasmodic, expectorant, and nasal decongestant properties. These properties make it ideal for use in conditions like cold and fever and reduce inflammation in conditions like asthma, bronchitis, sinusitis, infectious diseases, etc. The topical application of camphor acts as a counterirritant and antiseptic. There are several chemical varieties of camphor, each with different essential oil composition. *Cinnamomum camphora* contains camphor as the main component, along with cineol, linalool, eugenol, limonene, camphene, safrole, and a few more^[10-12].

Eucalyptus globulus

The use of Eucalyptus is growing in fields like phar-



maceutics, agriculture, cosmetics, and food. The active constituent is eucalyptol which

shows various pharmacological actions. *Eucalyptus globulus* belongs to the family *Myrtaceae*. The origin of Eucalyptus is from two words, "Eu", meaning "true", and "calyptus", meaning "to cover". It is so named because the lower bud contains united calyx and corolla parts which seal the flower until it blooms. Eucalyptus oil obtained from the leaves, fruits, buds, and bark of the plant shows analgesic, antiseptic, antibacterial, antiviral, antioxidant, nasal decongestant, anti-inflammatory, and anticancer properties. For this reason, Eucalyptus oil has applications in reducing pain, common colds, sore throat, influenza, sinus congestion, bronchitis, and pneumonia. It also reduces infections and inflammation in respiratory conditions like bronchitis, sinusitis, asthma, and COPD.

The medicinal importance of Eucalyptus largely depends on eucalyptol (1,8-cineole or cineole). It con-

stitutes more than 70% of the total oil. It also contains limonene, α -terpineol, macrocarpals, eucalyptin, flavonoids, alkaloids, tannins, and oleanolic acid^[13-14]. There are some studies that show the moderate antibacterial activity of Eucalyptus oil against gram-positive and gram-negative bacteria. The antimicrobial activity of Eucalyptus is due to the presence of eucalyptol. Various studies support the antimicrobial activity of Eucalyptus, making it a natural preservative. Eucalyptus oil can be an alternative antibacterial agent in Ayurveda for managing different infections^[15]. Various preclinical and clinical studies have revealed the potential use of Eucalyptus in managing respiratory diseases, pain, oral health, infectious diseases, cancers, etc^[13-14]. A study revealed eucalyptol as a potent inhibitor of inflammatory mediators such as cytokines. It may indicate the use of eucalyptol for long-term treatment of inflammation of the airways in asthma, bronchitis, and other steroid-sensitive disorders^[16]. A double-blind, placebo-controlled study revealed that the group treated with cineole (eucalyptol) showed improvement in acute bronchitis severity-sum score than the placebo group^[17].

CONCLUSION

A vapor patch is a novel and safe approach against vapor rubs containing petroleum jelly. The ingredients of vapor rubs are synthetic and may cause harm, especially to kids. The natural ingredients in Bibo clear vapor patch ultra® are well known to reduce the symptoms of upper and lower respiratory tract infections and diseases. The natural ingredients of this vapor patch are safe for children and adults. Compared with inhalers, a vapor patch is easy to use and does not require repeated administration.

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Source of Support: Nil

Conflict of Interest: None Declared

How to cite this URL:Kanchan B Jangid et al: Vapor Patch: A Disruption in Drug Delivery for Relieving Congestion. International Ayurvedic Medical Journal {online} 2022 {cited November 2022} Available from: http://www.iamj.in/posts/images/upload/5_9.pdf