

Botanical Medicines to Support Pediatric Respiratory Health



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PROFESSIONAL RESOURCES

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Introduction

Children of all ages face respiratory challenges such as earache, cough, runny nose, upper respiratory infections, sore throat and tonsillitis. Botanical medicines offer effective assistance for these issues. They can address acute aspects of infection and inflammation, as well as aid in breaking the vicious cycle of chronic illness. Numerous botanicals can be used to treat these conditions including echinacea, elderberry, eyebright, fenugreek, plantain, thyme, elecampane, marshmallow root, goldenseal, andrographis, anise seed and mullein. These botanicals can be used as primary treatment or adjunctive treatment for many conditions.

Acute Ear Infection - Acute Otitis Media (AOM)

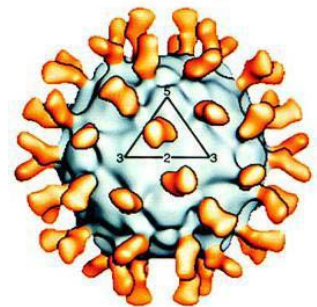
Acute otitis media (AOM) is one of the most common childhood health complaints. AOM is often accompanied by fever, night waking, irritability, URI and rhinitis. Typically, a “wait and watch” approach to care is used for this condition in older children; however, it is necessary to treat chronic serous otitis or Eustachian tube dysfunction if they are present.

Rhinovirus (RV)

Adults and children suffer from an estimated one billion colds every year, with adults typically getting two to four infections per year and children getting six to ten. A single sneeze may contain 20,000 viable RV droplets. And because RV remains stable in droplets for three to six hours and thrives in nasal PH and temperatures, this virus is easily transmitted via aerosol particles to hands, conjunctiva or nasopharynx.

Symptoms of RV are often characterized by watery discharge, nasal congestion and sneezing.

Infection of RV comes in many stages. Within 0 to 12 hours, induction, incubation and viral replication occur in the infected epithelial cells. At the 12 to 24 hour mark, viral replication induces oxidative stressors and signals cell-mediated immune responses. By 24 to 36 hours of infection, peak viral replication expires and



HRV:ICAM-1

the host defense continues to create oxidative stressors. Infected cells trigger vasodilation, which eventually leads to nasal mucus secretion, reactive airway disease, cough and runny nose. At 36 to 48 hours, the virus is destroyed by the immune system when polymorphonuclear leukocytes come to the infection site and degranulate the area. This degranulation causes disease symptoms associated with the common cold.

By this point, herbs can either treat the infection with antivirals, or they can be used to treat the symptoms (most commonly inflammation). Once the cold has advanced to 48 to 120 hours, inflammatory cascade induction associated with symptoms of the cold gradually diminishes. Damage to epithelial cells creates an opportunistic environment for secondary infection.

Cough

There are many reasons why a child might have a cough. Knowing why a cough is presenting will allow for a proper herbal treatment plan to be created. For example, if a cough is presenting because of allergies and post-nasal drip, herbs that target upper respiratory congestion and allergies should be prescribed. If the cough is present due to a bacterial or viral infection, a different line of botanicals needs to be used. In young children, reflux or aspiration of stomach contents often accompany a cough. Often, a nervous response accompanies this reflux. Because of this, using stress-reducing and tissue-relaxing herbs might be helpful. A small percentage of coughs are associated with serious illnesses so it is important to examine all possibilities for why the cough is presenting.

Allergic Rhinitis

Allergic rhinitis is an inflammatory disorder of the nasal mucosa. Onset occurs for toddlers and peaks between the ages of 6 and 10. It can be perennial or seasonal and is often associated with Eustachian tube dysfunction and conjunctiva irritation. Secondary smoke, indoor allergens and a family history of allergic rhinitis can be factors in this disease. It has also been associated as one of the major independent risk factors for asthma.

Sore Throat

Children often experience sore throats. While there are a number of reasons why this issue may be present, the most common are pharyngitis, tonsillitis or laryngitis. Sore throats can be the result of viral issues such as EBV, adenovirus, coxsackievirus or herpes simplex I. Sore throats can also be bacterial as the result of streptococcal bacteria, staphylococcus or mycoplasma. Allergies, irritants and post-nasal drip can also cause sore throats. Finally, overuse or strong emotions such as grief or anger can cause a throat to be sore.

In terms of herbal treatment, if a sore throat is caused by overuse or post-nasal drip, it is best to address the issue with anti-inflammatory or stringent herbs. On the other hand, if chronic issues cause a sore throat from strep or infection, immune-enhancing and anti-inflammatory herbs would be a good course of treatment.

General Botanical Approach to Childhood Respiratory Infections

When treating a respiratory infection, it is important to consider if the herb will have the proper functions to address the issue. For example, will an immune-enhancing herb be sufficient in treating the issue, or will a specific antiviral, an anti-bacterial or anti-fungal herb be optimal? Every time the body has an infection, an immune defense dynamic works to get the infection under control, leading to residual inflammation. If a child tends to have more allergies and has a family history of atopic issues, they will often experience more inflammatory dynamic post-infection.

Warming circulatory herbs like cinnamon and ginger help modulate secretions while initiating anti-inflammatory dynamics by promoting warming and relaxing of the tissues. Many herbs can address general issues that might involve the eyes, ears, nose and throat while others, like lung-specific herbs, can address one particular organ.

Immune Enhancing Herbs

Herbs can address specific or multiple symptoms. For example, echinacea purpurea flowers contain immune-enhancing dynamics and E. purpurea and angustifolia roots and mature seeds

contain anti-inflammatory properties. Black elderberry can address a wealth of viral issues. Andrographis is notoriously bitter, so it can't be administered to young children in tincture form; however, it can be given to older children in tincture form. Goldenseal can address issues involving mucus membranes of the ears, throat and upper respiratory system. It is particularly effective when combined with black elderberry.

Anti-Viral, Anti-Bacterial and Anti-Fungal Herbs

Echinacea, black elderberry, andrographis and goldenseal are immune enhancing herbs, but they also have antiviral and anti-bacterial dynamics. Thyme is another antiviral and anti-bacteria herb.

Anti-Inflammatory Herbs

Common anti-inflammatory herbs include echinacea purpurea and angustifolia roots, black elderberry, andrographis, eyebright, goldenseal root, marshmallow root, ribwort and mullein leaf. These can be used for a variety of issues, from toning mucus membranes, to diminishing inflammation. Herbs like marshmallow root are strong demulcents and can be used to replenish cell growth. Ribwort is effective when used for post-infection treatment because it has been shown to reduce chronic buildup of fluid. Both the leaf and the flowers of this plant can be used to support the throat and upper respiratory system.

EENT and Lung Herbs

Some herbs that can be used to treat issues of the ears, eyes, nose and throat include eyebright, elecampane, goldenseal root, marshmallow root, ribwort, mullein leaf and thyme. Many of these herbs have demulcent qualities, which is effective for treating respiratory issues.

Symptom Specific Herbs

Targeting precise symptoms can be done with symptom-specific herbs such as cramp bark, elecampane, eyebright, fenugreek seed, marshmallow root, thyme and mullein leaf. Many of the herbs help with muscle spasms, reducing tightness in the chest and the bronchial tree. This can be effective at treating issues that result from excessive coughing. Many of these also decongest, enabling relaxation and soothing burning or irritation. For these reasons, administering these herbs to a child at night will help them sleep through the night and reduce irritability during the day.

Dry Cough Formula

Dry cough caused by infection, post-infection, post-nasal drip or allergies can effectively be treated using a combination of mullein, ribwort or plantain, marshmallow, anise seed, cramp bark and ginger. Formulas using these herbs can be coupled with combinations of echinacea and goldenseal to address many infectious issues. Cramp bark, ribwort and marshmallow help to moisten, reducing irritation and dryness in the mucus membranes. Anise seeds are warming and help produce mild antimicrobial dynamics. Anise can be combined with ginger to produce even more concentrated, warming qualities.

Wet Cough Formula

Wet cough can be effectively treated using a combination of cramp bark, elecampane, licorice root, thyme, anise seed and cinnamon bark. While the wet and dry cough formulas are similar, the addition of licorice root and thyme aid in the movement of phlegm. Licorice is also soothing, which helps address irritation issues caused by coughing.

Herbal Ear Oil

Children commonly complain about earaches. While there are numerous botanical treatments to address this, one particularly effective external herbal ear oil involves using garlic oil, goldenseal root, lobelia herb oil, mullein flowers and St. John's wort flower buds. The garlic and goldenseal root in this formula provide antimicrobial benefits while also diminishing

microbials and fungus. Lobelia is an anti-inflammatory and relaxes the ear canal, diminishing pain. Mullein flowers aid relaxation while St. John's wort flowers are antiviral and diminish discomfort.

Ear, Nose and Throat Formula

Using a combination of black elderberry and flowers, eyebright, ribwort, fenugreek seed, thyme and anise seed can be an effective formula to treat issues of the ear, nose and throat. This formula focuses on addressing mucus membranes in the upper respiratory system. Each herb in the combination addresses particular issues related to the ear, nose and throat. For example, fenugreek acts as a decongestant and ribwort helps in drying. Eyebright tones and improves overall dynamics and provides astringency to promote growth of tissue and mucosal flora. Thyme provides antiviral support and elderberry flowers support eyebright and ribwort in bringing tone to the mucus membranes.

Immune Defense Formula

Herbs can be effective for providing immune defense. Common formulas might include elder flowers, bayberry root bark, black elderberry syrup, marshmallow root, cloves, Irish moss, cayenne pepper, ginger syrup, essential oils of allspice, cinnamon and peppermint. These herbs act to warm the body.

The formula can be given as a hot drink. Hot water aids in raising the body's temperature, stimulating circulation, sweating and a general immune response. Keeping the body warm by applying external heat such as a bath, going to bed or wrapping up in a blanket can also increase warming. Giving children a cup of one part boiling water and one part fruit juice can also be an effective treatment option. These approaches can also limit the length of a sickness if done at the onset of a cold.

Botanical Formula for Allergic Rhinitis

A tonifying formula to treat allergic rhinitis might include black elderberry and flowers, eyebright herb, ribwort, fenugreek seed, thyme and anise seed. This formula can be given two or three times a day over a longer period of time to build up. If the child suffered from acute

congestion or fullness in the upper respiratory system, a larger dose would be administered about five times a day as a decongestant.

Acute Respiratory Infection Formula

When it comes to acute issues, a mixture of syrups can be effective at treating a number of issues. By using an echinacea (angustifolia and purpurea roots), licorice root extract, black elderberry syrup, thyme, garlic syrup, goldenseal root extract and immune defense formula can provide effective support to the body.

Garlic syrup, goldenseal and thyme provide antibacterial support. Goldenseal also helps with tonification and astringing membranes. Warming herbs are found in the immune defense formula. Mixing syrups and herbal tinctures also often improves the taste, making it more palatable for the child.

Echinacea Species

Often, different parts of an herb will contain different constituents. Echinacea is a clear example of this. There two forms of echinacea: *E. angustifolia* and *E. purpurea*. The *angustifolia* species has activity mostly limited to the root which contains the phenolic compounds cichoric and caftaric and other phenols including echinacoside, alkylamides. The alkylamides are the most active in *angustifolia* root and have proven to be anti-inflammatory in nature. *E. purpurea* aerial parts (flowers) contain essential oils, flavanoids, polysaccharides, arabinogalactan proteins, caffeic acid derivatives and alkamide fractions.

When harvested in their early developmental phases, the flowers of echinacea contain arabinogalactin proteins and polysachharides. These chemicals support ongoing immune function and are bestused long-term for immune system building. The roots are typically harvested in the fall and contain large amounts of alkylamides, which produce strong anti-inflammatory responses and are therefore best used at the onset of illness.



Isobutylamides compounds called RxA factors represent the alkylamide fraction. RxA factors are found in the roots of *E. angustifolia* and *purpurea* and also in the mature ripe seed of *E. purpurea*. They have anti-inflammatory actions. echinacea helps build immune health in sinuses and throat epithelial cells, reducing the effects of airborne stressors.

Echinecea works with the immune system, providing stimulation of the innate immune system. As an anti-inflammatory it promotes lymphatic and respiratory functions. It can also address recurrent pharyngotonsillitis and otitis media in children.

Supplementation with standardized echinacea tablets, if taken before and during travel, may have preventive effects against the development of respiratory symptoms during travel involving long-haul flights. Prophylactic intake of *E. purpurea* over a four-month period was shown to reduce recurrent respiratory infections and prevent further episodes.^{1, 2}

Using a combination of echinacea propolis and vitamin C was shown to prevent respiratory infections in children in a randomized, double-blind, placebo-controlled, multi-center study.³

Black Elderberry

Both the flowers and the berries in black elderberry are medicinally active. The berries are high in flavonoid compounds. These compounds provide therapeutic activity as anti-viral, anti-inflammatory, anti-oxidant and immunotonic agents. The berries have been shown to inhibit several strains of influenza.

Black elderberry has been shown to be effective on acute and chronic respiratory diseases including chronic rhinitis, serious otitis, acute otitis media, chronic sinusitis, acute influenza, fever and URI.

The berries have anti-viral actions because the constituents neutralize the



¹ Evid Based Complement Alternat Med (2012) 2012:417267,ISSN: 1741-4288

² Evid Based Complement Alternat Med (2012) 2012:841315, ISSN: 1741-4288

³ (Cohen HA Varsano I Kahan E Sarrell EM Uziel Y.,: Arch Pediatr Adolesc Med (2004 Mar) 158(3):217-21)

activity of the hemagglutinin spikes found on the viral surface. When these hemagglutinin spikes are deactivated, the viruses cannot pierce cell walls, enter the cell or replicate. It is also effective at treating influenza viruses A and B, Herpes simplex virus type 1 (HSV-1).^{4,5}

Elderberry extracts also have immune-modulating activity due to their ability to stimulate production of certain cytokines, leading to activation of phagocytes facilitating movement to inflamed tissues.⁶

A randomized, double-blind, placebo controlled clinical trial revealed that 200mg per day of andrographis greatly minimized the risk of catching a cold when compared to a placebo.⁷

Eyebright

Eyebright is effective when given as a preventative treatment. This can be particularly important when children return back to school. It contains iridoid glycosides, flavonoids are anti-catarhal, anti-inflammatory, anti-microbial and astringent.

Goldenseal

The root and rhizomes of goldenseal are highly concentrated in isoquinoline alkaloids or protoberberines. It performs action on the immune, digestive, cardiovascular and nervous systems and mucosal membranes in general. Numerous studies have validated the immune potentiating effects of these chemicals.

⁴ Zakay-Rones Z, Varsano N, et al.. J Altern Complement Med 1995;1:361-369

⁵ Zakay-Rones Z, Thorn E, et al.. J Int Med Res 2004;32:132-140

⁶ Janeway CA Jr, Travers P, Walport M, Shlomchik MJ. Immuno Biology 5. The Immune System in Health and Disease. New York, NY: Garland Publishing; 2001: 12

⁷ Caceres DD, Hancke JL, Burgos RZ, et al. Phytomed 1997;4 (2) 101-104

Mullein

The dried leaves of mullein are traditionally used as a tea to support pulmonary and respiratory functions. Mullein contains more than 46 different groups of compounds, most notably mucilage, saponins, coumarins and glycosides. It is a lung specific herb that performs restoring and toning actions on the bronchial epithelial tissue.

Ribwort

Ribwort has anti-inflammatory, spasmolytic and immunostimulatory actions. Positive benefit-risk-ratios allows the recommendation of plantain in moderate chronic irritative cough, especially for children. It is also an effective herb for treating chronic bronchitis.^{8, 9}



Thyme

Thyme is antibacterial, antioxidant, expectorant, spasmolytic and a topical anti-microbial. The essential oils of the plant can also be used. It has biphenyl compounds, flavonoids and phenolic glycosides and has broad spectrum antibacterial effects on URI.

⁸ Wegener 1999

⁹ Matev 1982

Sample Case Study

A two-year-old girl presents with pediatric otitis media. She had bilateral otitis media, suffering from three episodes in a four-month period with two courses of antibiotics in four months to treat the episodes.

She presented with a temperature of 102.9. She had bilateral fluid, with bulging, right, red taponic membranes. Her nodes were enlarged bilaterally. She had a sore throat accompanied by thick, cloud discharge from her nose. She was teething, increasing her risk for otitis. She was grumpy and had an episode of croupy cough the previous night.

A treatment plan for this child would include the following:

- Acute infection formula: 2mls, QID
- Ear, nose and throat formula: 2mls, QID
- Herbal punch: 6oz of spearmint, chamomile and anise seed infusion with 10 drops immune defense formula.
- Topical ear oil and herbal vapor rub applied with heat for 15 min BID and hs
- Probiotics: 5-10 billion/day, mix strains

Conclusion

There are many reasons why a child might get sick and many treatment options available. Botanical remedies provide a less accosting solution than traditional medicines to help reduce infection time, improve symptoms, and help the child build immunities. From earaches to coughs and upper respiratory infections to sore throats, botanical medicines can address common childhood complaints and sicknesses effectively and gently. Herbs such as echinacea, elderberry, eyebright, fenugreek, plantain, thyme, elecampane, marshmallow root, goldenseal, andrographis, anise seed and mullein can help with both acute and chronic illnesses, improving the overall health of the child and lowering the risk for future infections.

Contributor

Dr. Mary Bove obtained her doctorate of naturopathic medicine and midwifery certification from Bastyr College of Natural Health Sciences in Seattle, WA and received her diploma of

phytotherapy/herbal medicine at the School of Phytotherapy in Great Britain. Dr. Bove continues to practice Naturopathic Family Medicine at the Brattleboro Naturopathic Clinic, Brattleboro, VT. While a full-time faculty member at Bastyr University, Dr. Bove chaired the departments of Botanical Medicine and Naturopathic Midwifery. She served as adjunct faculty for the Massachusetts School of Pharmacy and Scottish School of Herbal Medicine Masters level course. Dr. Bove is a member of the Gaia Herbs Professional Solutions Scientific Advisory Board.

Dr. Bove is the author of the *Encyclopedia of Natural Healing for Children and Infants* considered an authoritative reference on natural pediatric medicine. Mary co-authored *Herbs for Women's Health* and has been published in many magazines, journals and collaborative books on botanical and natural medicine. She lectures and teaches internationally on the topics of naturopathic medicine, botanical medicine, pediatrics, natural pregnancy, childbirth, traditional food medicine and mind-body healing. In collaboration with Gaia Herbs Dr. Bove developed an herbal remedy line designed specifically for children and is an educational, medical consultant within the natural product industry.