

# Use of phytotherapy in pediatric respiratory diseases

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## ABSTRACT

Herbal medicine is a mild and well-tolerated alternative treatment method that could be used to treat pediatric respiratory ailments. Medicinal plants such as capstan, geranium, turmeric or echinacea have been shown in numerous studies to have the ability to significantly improve the respiratory function of pediatric patients and may thus be a viable alternative to conventional treatments in acute and chronic respiratory diseases.

**Keywords:** phytotherapy, aromatherapy, pediatric respiratory diseases, asthma, pneumonia, cystic fibrosis, turmeric, echinacea, geranium

## INTRODUCTION

Phytotherapy is an alternative treatment for many conditions in the adult population. It is a mild and well-tolerated method of treatment that could also be useful in pediatric conditions in the case of side effects, resistance to medicine or contraindications to the administration of certain types of medicine at an early age.

Many parents turn to alternative treatments on their own initiative, often by consulting the internet and seeking advice from people without medical training. On the other hand, there are insufficient studies on alternative treatments for this age group, which makes doctors reluctant to prescribing herbal medication to pediatric patients. However, the use of herbal treatments is a growing process. This fact is a reality not only in Romania, but in other countries as well.

Thanks to the progress of science, also manifested in the field of chemistry and pharmacology, today we can benefit from standardized plant products and more effective control of phytochemicals and their effects. This, in correlation with the conduct of clinical studies done in the pediatric population, may contribute to the widespread use of phytotherapy in pediatrics in a responsible manner, under medical supervision, and to the monitoring of both therapeutic and possible adverse effects.

## OBJECTIVES

The aim of this study was to identify and analyze existing studies on the use of phytotherapy, in terms of pediatrics, in respiratory diseases.

## MATERIALS AND METHODS

We searched for articles and scientific studies on the use of phytotherapy in pediatrics in respiratory diseases in the electronic database of Pub Med, Google Academic and Science Direct, between 01.01.2008-30.03.2021. We have included in our research studies on phytotherapy and aromatherapy in pediatrics. We did not include materials that refer to homeopathic treatments or vitamins.

## DISCUSSIONS

The use of phytotherapy is of great concern in countries with a well-developed medical system and has been documented in various conditions in the pediatric population, by itself or in combination with other types of medicine [1,2,3,4,5,6].

In our research we have discovered studies on the use of plant products in pediatric respiratory, digestive, endocrine, metabolic, urinary, dermatological, oncological diseases etc., but we focused our attention on the respiratory ones, following that the

other categories will be approached separately, being the subject of subsequent scientific materials.

Among respiratory diseases, asthma has been a research topic for several scientific studies [7,8]. These studies show that up to 89% of parents use complementary and alternative medicine to treat their child's asthma. One explanation for this is the chronic nature of the condition and the long-term side effects of conventional medication. Among the plants and substances that have improved respiratory function are *Petasites hybridus* (captalan) and pycnogenol, whose use has been shown to significantly improve lung function and asthma scores, decrease airway inflammation and reduce the dose of medication. Other plants and substances mentioned for their effect in asthma, especially in adults, are *Boswellia serrata* (incense), *Tylophora indica*, *Lobelia inflata*, ginger, eucalyptol.

A meta-analysis [9] that investigated the use of Acupoint herbal patches (AHP) in the treatment of childhood asthma with traditional Chinese medicine identified eleven studies involving 882 children with asthma. White mustard seeds, *Corydalis* rhizome and *Kansui radix* were the most commonly used herbs. Adjuvant treatment with AHP significantly reduced the frequency of acute asthma attacks and improved peak expiratory flow. This particular investigation concluded that adding herbal patch-based treatment to conventional medication could reduce the frequency of asthma attacks compared to conventional medication alone.

Turmeric (*Curcuma longa* L.) was evaluated in an arbitrary, double-blind, placebo-controlled clinical study [10] that showed improvement in children and adolescents with asthma. Patients were arbitrarily chosen to receive 30 mg / kg / day of *C. longa* for 6 months or a placebo. Patients receiving turmeric experienced less frequent nocturnal awakenings, less frequent use of short-acting  $\beta$ -adrenergic agonists, and better control of the disease after 3 to 6 months, compared with those receiving placebo.

Furthermore in regards to asthma in children, the root extract of *Pelargonium sidoides* (geranium) has been evaluated [11] for its effectiveness in reducing asthma attacks. The study enrolled 61 children with asthma with viral upper respiratory tract infection and found that the group of children who received treatment with *Pelargonium sidoides* had a lower incidence of asthma attacks during viral respiratory tract infections.

Geranium (*Pelargonium sidoides*) was the subject of a literature review [12] that analyzed seven studies with 1.067 children under the age of 6 regarding efficacy in acute respiratory tract infections. In most cases, the children experienced complete recovery or major improvement in symptoms during the treatment period. The geranium-based

preparation was effective in asthma, acute pharyngotonsillitis and acute rhinosinusitis.

*Pelargonium sidoides* has also been the subject of studies [13] on the evaluation of the efficacy of this plant in acute bronchitis in children. The study included 220 children, divided into age groups (1 - 6 years, 6 - 12 years, 12 - 18 years), who were given geranium or placebo for 7 days. There has been an improvement in cough and auscultation in patients receiving geranium, indicating that this plant may be a well-tolerated and effective treatment option for acute bronchitis.

A multicenter, arbitrary, open-label clinical study [14] was conducted on the safety and dose-dependent effects of echinacea in the treatment of episodes of acute respiratory infections in children. The study was performed on a sample of 79 children aged 4 to 12 years who were given Echinacea extract from the first signs and symptoms of respiratory infection compressed. The results were dose-dependent, leading to shorter illness and fewer recurrences in the next period in children who received a higher dose.

In regards to other respiratory ailments, such as bronchiolitis, questionnaires from children with this condition revealed that they had turned to traditional Chinese medicine and were satisfied with their effects [15].

In pneumonia with *Mycoplasma pneumoniae*, it has been found [16] that the combination of Chinese remedies with antibiotic therapy (azithromycin) has shown more obvious clinical benefits and significant efficacy compared to antibiotic treatment alone. Another study [17] compared the ameliorating effects of the traditional Chinese formula Qing-fei Tongluo and azithromycin on *Mycoplasma pneumoniae*. The conclusion of the study was that classical Chinese medicinal treatment inhibited the progression of pneumonia with *Mycoplasma pneumoniae*, reduced vascular permeability, and improved pulmonary microcirculation more efficiently than conventional azithromycin treatment.

In the treatment of cough in traditional Iranian medicine, the plant called *Zataria multiflora* has been shown to have a positive effect. Thus, the following study [18] carried out a literature review on the use of this plant in cough treatment, by itself or in combination with *Althaea officinalis* (mallow) or the essential oil of *Foeniculum vulgare* (fennel). All clinical studies analyzed confirmed the effectiveness of *Z. multiflora* in relieving acute cough in children, adolescents and adults, with no adverse effects reported.

Aromatherapy plays an important role in herbal treatments. Essential oils are used mainly through diffusion through the medium of aromatherapy lamps or are applied topically, by massage, diluted

in a vegetable oil. There are studies [19] done on their effectiveness in various respiratory diseases, especially in adults, the pediatric bibliography being poorer. We should mention here a case [20] of a 3-year-old child under oxygen therapy for a respiratory syncytial virus pneumonia who benefited from aromatherapy. The patient, also suffering from central myopathy, restrictive lung disease, scoliosis and atelectasis of the left upper lung lobe, was under oxygen therapy for 18 days, during which time she also received allopathic medication. On the 18th day of the illness, the medication was stopped and, at the request of the parents, a combination of lavender, thyme, balsam fir and peppermint was spread in the patient's room, thus passively inhaling these substances. There has been a significant improvement in the patient's condition, consisting of reducing the need for oxygen after the administration by diffusion of essential oils. Oxygen saturation increased from 94% to 97%, reducing desaturation episodes.

The antimicrobial potential of essential oils has also been studied in patients with cystic fibrosis and it is a well known fact that they suffer from recurrent and chronic respiratory infections from the first years of their life, involving increasingly resistant bacterial strains, antibiotics, such as *Staphylococcus aureus* or *Pseudomonas aeruginosa*. The test we report here [21] was performed on respiratory samples obtained from 30 patients with cystic fibrosis with an average age of 20.5 years. Three essential oils with bactericidal activity on the mentioned bacterial strains are noted in this study: cinnamon, sweet birch and juniper oil.

As one of the deterrents of administering phytotherapeutic treatments for children is related to pharmaceutical forms such as tinctures or alcohol-containing extracts, we consider it useful to men-

tion a study [22] which assessed blood alcohol levels after oral administration of a fixed combination of thyme root extract and primrose in children with acute bronchitis. This study showed a favorable risk / benefit ratio of the drug in that case.

## CONCLUSIONS

The frequent usage of herbs in general, and in pediatrics in particular, indicates that phytotherapy is an important therapeutic resource, worthy of consideration in the prevention of certain diseases and in the relief of symptoms, alone or in combination with treatments of other types of medicine. It can be observed from the short scientific incursion undertaken that there are plants whose action is beneficial in respiratory diseases encountered in children. These include *Petasites hybridus* (captalan), *Boswellia serrata* (incense), *Pelargonium sidoides* (geranium), *Turmeric longa* (turmeric), *echinacea*, etc. These plants, through their active compounds, can significantly improve the respiratory function of pediatric patients and most of them can be a viable alternative to conventional treatments, both in acute and chronic diseases. Given this perspective, I believe that it is beneficial for physicians to acquire knowledge of alternative therapy in order to allow patients to have access to herbal medication when the conditions can be treated as such. In this regard, access to safe medication can be ensured, in which possible interactions between medicinal substances and unwanted side effects can be avoided. It would also encourage the use of standardized products recommended by specialists, and eliminate the danger of recommending these products by untrained people and plants harvested in unsafe conditions and contaminated with various pollutants.

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