

## ORIGINAL ARTICLE

# Herbs use in Saudi children with acute respiratory illnesses

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### ABSTRACT

The current study aims to evaluate the prevalence of the utilization of various herbal remedies in children hospitalized with lower respiratory illnesses and assess the different herbal products which are most commonly used. Moreover, the indications of usage and the route and frequency of administration are also highlighted. All children who were hospitalized in three centers, through the period of 18 months, due to acute bronchiolitis, pneumonia, or bronchial asthma were included in this study. Any caregivers who were present during the hospitalization of such children were asked if they could respond to a questionnaire that included the names of any herbal products that they used, the indications which warranted their usage, and the frequency and route of administration. A total of 155 patients with acute lower respiratory illnesses were included. The overall prevalence of herbal medicine use was found to be 59.3%. The highest percentage of use was amongst

children with bronchiolitis. Around 24 herbal products were used; the most common ones being sesame oil, fenugreek, olive oil, and dates. The most common indications of use were in order to relieve cough and abnormal breathing. The oral route was the main route of administration (95.7%) followed by nasal administration (4.3%). The median number of frequency of administration was two times. In conclusion, the use of herbal medicine in Saudi children with acute lower respiratory illnesses is very common. Further studies to assess the safety profile and possible benefits of these products are needed.

### KEYWORDS:

Acute lower respiratory illnesses; Herbal remedies; Child; Saudi Arabia.

### INTRODUCTION

Globally, respiratory illnesses in children, such as bronchiolitis, pneumonia, and asthma constitute a major cause of hospitalizations and emergency

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room visits. Data suggests that these illnesses are also a major cause of death in childhood [1]. Alternative medicine employing the use of natural remedies obtained from herbs has long been practiced to treat many illnesses from ancient times [2]. Traditional herbal medicine has thus grown substantially over a period of time and principally uses naturally occurring, plant-derived substances with minimal or no industrial processing in order to treat illnesses according to local or regional healing practices [3]. Moreover, herbal medicine employs a “signs and symptoms-oriented” treatment program without a full understanding of the underlying disease [2,4]. More than 250 plant species are in use as herbal medicine in the Middle Eastern region. Based on previously reported data, at least 16–17 plant species are regularly used to treat respiratory diseases [5,6]. However, the safety profile of these herbal extracts has not been thoroughly investigated. In fact, in the absence of a herbal medicine registry, regulations for herbal medicine workers, and an appropriate licensing system, the safety of such a practice is both questionable and a cause for concern. In Saudi Arabia alone, the practice of using plant-based oil products during acute respiratory illnesses is very common. Lung parenchymal changes consistent with lipoid pneumonia following the introduction of olive oil have been reported in five Saudi children [7]. In addition, a case-series from Saudi Arabia described the clinical and radiological picture of more severe lipoid pneumonia following the introduction of ghee in 24 Saudi children [8]. Similar practices of utilizing plant-based oil and animal ghee in children were reported in another study carried out in Mexico [9].

Owing to the possibility of serious health complications arising from the use of unregulated traditional herbal medicines, it is mandatory to understand their use in the general population in order for appropriate measures to be put into place. To the best of our knowledge, the practice of using herbal medicines amongst Saudi children hospitalized with acute respiratory tract illnesses (ARTI) has never been investigated prior to this study. Therefore, we evaluated the prevalence of herbal product usage in children hospitalized with ARTI. In addition to this, the indications

warranting the use of herbal preparations, as well as the frequency and routes of administration, and the list of herbal products introduced by the caregivers have all been assessed.

## MATERIALS AND METHODS

A multi-center prospective interview-based study was conducted in Saudi children aged 1 week–15 years. Subjects were diagnosed with ARTI, such as bronchiolitis, pneumonia, or asthma and were admitted to the general pediatric wards or pediatric intensive care units at King Khalid University Hospital, Riyadh; King Saud Medical Complex, Riyadh; and King Khaled General Hospital, Al Majm’ah from November 1, 2016 to April 30, 2017. After obtaining their consent, caregivers were then interviewed by one of the researchers involved in this study. Participants were asked to answer a questionnaire which included the names of various herbal medicines, indications of use, route of administration, and frequency of use. Information regarding the diagnosis, age, and gender of the child were obtained from patients’ records. The data were analyzed using the IBM SPSS® statistical package for Windows®. The approval of the Ethical Research Board was obtained before commencing the study.

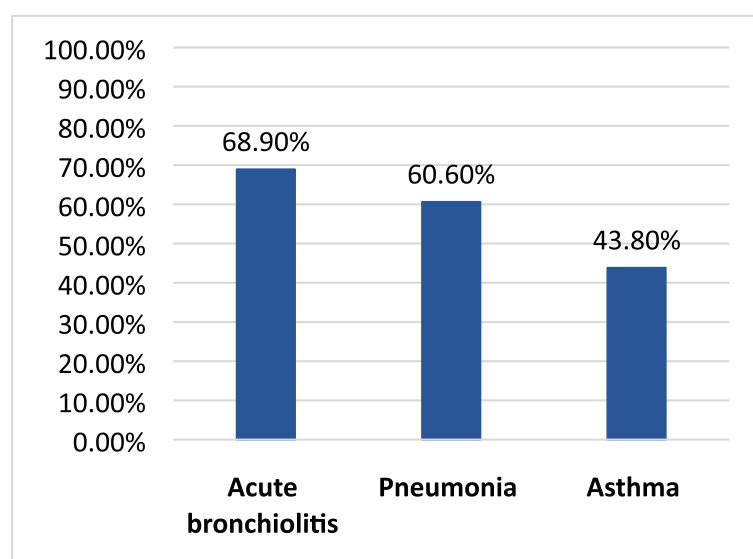
## RESULTS

A total of 155 patients (acute bronchiolitis: 74; bronchial asthma: 48; pneumonia: 33; males: 64.5%) were included in this study. About 59.3% of subjects used herbal medicines during their illnesses prior to hospitalization. Twenty-four herbal products in different forms were used during bouts of acute respiratory illnesses. The most frequently used products (Table 1) were sesame oil (used by 18.7% of subjects) followed by fenugreek (14.2%), olive oil (12.3%), and dates soaked in water (10.3%).

The use of herbal medicines (Figure 1) was highest in 51 patients with acute bronchiolitis (68.9% of whom used herbal preparations) followed by 20 pneumonia patients (60.6%), and 21 children with bronchial asthma (43.8%). The most common indications were cough ( $n = 88$ ; 95.6%), abnormal breathing ( $n = 14$ ;

**Table1** - List of herbal products commonly used in children with lower respiratory tract illnesses.

Product name	Plant's scientific name	Frequency of use among 155 patients (%)
Sesame oil	<i>Sesamum indicum</i>	18.7
Fenugreek	<i>Trigonella foenum-graecum</i>	14.2
Olive oil	<i>Olea europaea</i>	12.3
Dates	<i>Phoenix dactylifera</i>	10.3
Anise	<i>Pimpinella anisum</i>	9.7
Sugarcane	<i>Saccharum officinarum</i>	9
Cumin	<i>Cuminum cyminum</i>	7.7
Gum Arabic	<i>Acacia nilotica</i>	7.1
Radish	<i>Raphanus raphanistrum</i>	6.5
Mahaleb	<i>Prunus mahaleb</i>	3.9
Garden Cress	<i>Lepidium sativum</i>	3.9
Ginger	<i>Zingiber officinale</i>	3.2
Mint	<i>Mentha</i>	1.9
Thyme	<i>Thymus vulgaris</i>	1.9
Black seeds (Mixed with honey)	<i>Nigella sativa</i>	1.9
Camomile	<i>Matricaria chamomilla</i>	1.3
Krameria triandra root	<i>Krameria triandra</i>	1.3
Fennel	<i>Foeniculum vulgare</i>	1.3
Garlic	<i>Allium sativum</i>	0.65
Anzroot	<i>Astragalus sarcocolla Dymock</i>	0.65
Green tea leaves	<i>Camellia sinensis</i>	0.65
Maramyah	<i>Salvia officinalis</i>	0.65
Coffee leaves	<i>Coffea</i>	0.65
Camphor oil	<i>Cinnamomum camphora</i>	0.65



**Figure 1.** Percentage of herbal products use by diagnosis.

15.2%), nasal blockage ( $n = 1$ ; 1.1%), and stridor ( $n = 1$ ; 1.1%).

The main routes of administration were oral ( $n = 85$ ; 95.6%) and nasal (4.3%). Nasal use of a product took place by directly administering the product into the nose. This was the case with olive oil and myrrh. There were also cases when a child with pneumonia was asked to sniff a product made from mint. The use of more than one herbal product was observed in 63% (58/92) of those who used herbal medicine.

## DISCUSSION

To the best of our knowledge, this is the first study in Saudi Arabia that has examined the behavior of the community with regard to the use of herbal medicine amongst Saudi children who were hospitalized due to acute lower respiratory tract illnesses. Despite there being a clear lack of official monitoring in relation to the use of traditional herbal medicine in our country, the use of different herbal products remains a very common practice among caregivers. Our study has informed us that caregivers use herbal medicaments in an attempt to alleviate the disease symptoms of the children under their care.

The prevalence of herbal medicine use in children with respiratory illnesses prior to hospitalization was as high as 59.3% according to our study. Subjects with bronchiolitis were the most exposed to herbal medicines followed by patients with pneumonia and bronchial asthma. Approximately, 24 different herbal products that were extracted from plant species in different forms (i.e., oil extract, raw form, soaked in water, or blended to powder form) were identified. The most frequently used products are herbal oil extracts, such as sesame and olive. Other commonly used herbal preparations include fenugreek seeds soaked in water and dates soaked in water. The different routes of administration of such herbal products were mostly oral and/or intranasal (in case the rejection of the oral intake of the herb took place or in the presence of significant nasal symptoms). Direct introduction of the herb and/or the sniffing of it were used for intranasal

administration. Moreover, caregivers were likely to administer more than one herbal product during the same illness.

It is evident that herbal medicine use within the Saudi community is based on the symptoms of the disease regardless of its underlying pathology. The most frequent indications of respiratory illness are cough and abnormal breathing. This raises serious concern for children with acute bronchiolitis who were subjected to the administration of herbal oil by caregivers. Owing to a possible risk of associated lipoid pneumonia during acute bronchiolitis, this potentially problematic area requires further investigation. We also presume that tachypnea during acute bronchiolitis and the low density of the herbal oil itself could make the risk of aspiration of such oily products high.

Incidentally, the caregivers tended to use herbal products regardless of the child's age. For example, in a 3-month-old child with bronchiolitis, the caregivers introduced eight different products during the course of the illness (including fenugreek, dates, olive oil, and other herbs). This rather dubious behavior, on the part of a caregiver, raises major concerns for the health and safety of the child as their gastrointestinal tract may well be unable to receive such products at such a tender age.

This study did not document the use of ghee as was reported in a previous case series that correlated the administration of ghee with lipoid pneumonia. The reason for this could be due to the fact that ghee is more commonly used in the rural areas of the south-western region of Saudi Arabia, whereas our study location was in the central region [8].

In summary, the practice of herbal products use in various different forms and via different routes of administration is a very common practice among Saudi children hospitalized with acute lower respiratory illnesses. The lack of proper monitoring of such practices, as well as the lack of an official "herbal products registry" raises concerns about the safety of such practices. We recommend, therefore, that investigation on the safety and efficacy profiles of herbal medicines

be carried out before their use. It is important to weigh the risks versus the benefits of using herbal medicines prior to their usage. This is even more necessary given the possibility of aspiration pneumonia in young children with bronchiolitis who are given oil-based herbal products in an attempt to cure them.

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