

WHO/FCH/CAH/01.02
ORIGINAL: ENGLISH
DISTR.: GENERAL

**COUGH AND COLD REMEDIES
FOR THE TREATMENT OF
ACUTE RESPIRATORY INFECTIONS
IN YOUNG CHILDREN**

CHILD AND ADOLESCENT HEALTH AND DEVELOPMENT



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Acknowledgements

This document was prepared by the Department of Child and Adolescent Health and Development of the World Health Organization. A special debt of gratitude is owed to Dr Harry Campbell, Edinburgh, Scotland; Dr Ann Gadomski, Baltimore, USA; Dr Sandy Gove, Berkeley, USA; Dr Antonio Pio, Mar del Plata, Argentina; and Dr Steven Redd, Atlanta, USA. The World Health Organization is also grateful to the many health professionals who reviewed the manuscript and provided valuable practical comments.

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Designed by minimum graphics
Printed in Switzerland

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1. Introduction

Mothers often bring children with an acute upper respiratory infection to a clinic because of concerns about the child's cough, fever, sore throat, or blocked nose, or because of problems with feeding. Cough is a symptom of most acute respiratory infections (ARI) including both upper respiratory infections (URI), such as coughs and colds (also known as the common cold, coryza, acute nasopharyngitis or acute pharyngorhinitis), and the more serious lower respiratory infections (LRI) such as pneumonia, bronchitis and bronchiolitis. Medicines for the symptoms of upper respiratory infections are sought both for the relief of discomfort and as a response to the fear that the illness is potentially serious. Parents usually do not understand the mechanisms of these infections, and do not appreciate that a "cure" does not exist. The case management of ARI focuses on case detection and treatment of pneumonia but must also assure the adequate management of children with a cough or cold who do not have pneumonia (1–3). Health care providers spend a significant amount of time caring for children who present with these symptoms, and are under great pressure to treat them with "something". Their jobs are further complicated by the large number of preparations for cough and cold that are available, either by prescription or as over-the-counter preparations.

Respiratory tract infections are among the most important human health problems because of their high incidence and consequent economic costs. The number of ARI episodes (6 to 8) per child per year is similar in both developed and developing countries (4,5). The majority of respiratory infections are confined to the upper respiratory tract and most of these are simple coughs or colds. The mean duration of a simple upper respiratory infection in young children is 7–9 days (6). According to reviews of the medical literature (7), drug therapy for viral common colds produces few measurable benefits in adults. Symptomatic therapies, particularly oral or intranasal sympathomimetics, may provide short-term clinical relief, but all the available symptomatic treatments for common colds have associated side-effects. Nevertheless, persons afflicted with the common cold ingest a wide variety of over-the-counter preparations and prescription drugs, which they hope will cure the illness or relieve its symptoms, and many adults consider these remedies to be effective. Much of the therapy given to children is based on experience with these preparations in adults.

While it is clear that we are unable to cure the common cold, it is unclear how much we can really relieve the symptoms without risking toxicity in children. There is a growing consensus in the medical literature that many classes of preparations provide little (if any) relief of symptoms, and they exhibit significant undesirable effects. The latter are especially true in young children (less than 5 years

old). Cough and cold remedies are responsible for a significant proportion of emergency calls to poison control centres in the USA, and accidental ingestion by children as well as inadvertent overdosing by parents are often serious enough to warrant admission (8). Moreover, there are no data to suggest that these preparations prevent more serious disease (9). Of particular concern is the availability of cough syrups for children which contain alcohol. A survey of the labels and inserts of 142 cough syrups stocked in nine commercial pharmacies in Davangere, a town in south India, found that 23 of them contained from 2.8% to 20% of alcohol (10). Because of toxicity and drug interactions, alcohol should not be used in children's medicines. The World Health Assembly in 1987, noting that alcohol is present in many medicines, including medicines administered to children, urged Member States to review the registration of medicines containing alcohol as an active ingredient with a view to reducing its use as much as feasible (1).

Nevertheless, substantial sums are spent on cough and cold medicines in the developing world as well as in industrialized countries. It has been estimated that global sales in 1985 of over-the-counter medicines for cough and cold amounted to US\$ 3000 million (excluding eastern European markets). In 1987, sales of cough and cold syrups in the Philippines totalled US\$ 47 million; in the USA the total was more than \$2000 million (11).

An ideal cough or cold medicine should alleviate a child's ARI symptoms in the recommended dosage without producing serious side-effects. It should not mask signs of concomitant infection, or cause sedation that interferes with the intake of food and fluids. Cold medicines should also be affordable and easy to administer. Carers should feel that the remedy recommended is appropriate for the child's illness. Rapport with the physician should encourage the carer to return if the child gets worse, or when the next episode of respiratory infection occurs (particularly if there are signs suggesting pneumonia).

This document reviews the efficacy and safety of cough and cold medicines in young children (under 5 years of age) with an acute respiratory infection. A systematic literature review (see Section 4 below) was carried out to identify appropriate randomized controlled trials (RCTs). The results of the relatively few RCTs which have been carried out in children are especially important. Results from trials carried out on adults cannot be reliably extrapolated to include children owing to important differences in their anatomy and immune responses and in the etiology of the common cold. The pharmacokinetics and toxicity of drugs in children are often different from those in adults. Plasma drug concentrations may differ substantially because of immature liver and kidney functions and differences in gastrointestinal absorption, plasma binding, and relative volumes of fat and water. As a general rule, the differences are more pronounced in infants and young children and in malnourished children (12,13).

It is also important to consider only trials of treatment of coughs and colds and not to extrapolate the findings from other conditions presenting with similar symptoms; for example, antihistamines are effective for controlling symptoms in allergic rhinitis but not for rhinorrhoea in the common cold.

The use of antipyretics and oral analgesics is not discussed in this document; the subject was summarized in another technical review paper entitled "The manage-

1. INTRODUCTION

ment of fever in a young child with an acute respiratory infection” (14). The effects of cough and cold medicines in children with asthma, cystic fibrosis, or allergic disorders, as well as in adults with chronic conditions, are also not covered in the present review. This document does not discuss antibiotic treatment, which has no role in the management of children with the common cold because antibiotics do not shorten the duration of the illness and do not prevent complications or the development of pneumonia.

2. Pathophysiology of the common cold

The common cold is a self-limiting condition and must be distinguished from respiratory infections, such as pneumonia, otitis media and streptococcal pharyngitis, for which effective therapy does exist. These more serious infections have specific signs and symptoms which are not present in the common cold and which require specific antibiotic treatment (1–3). Almost all episodes of the common cold in the developed world are attributed to viruses, including rhinoviruses, parainfluenza viruses, influenza viruses, adenoviruses, respiratory syncytial virus and coronaviruses (15–17). Infection with one of the serotypes of rhinovirus accounts for up to 50% of colds in adults, but it is probably a less frequent cause of colds in children (18). No etiological agent can be identified in approximately 30% of common cold episodes (19). The same pathogens have been identified as causing colds in developing countries although etiological studies have been limited (20). Pneumonia, bronchiolitis, measles and pertussis can begin with symptoms resembling the common cold.

Symptoms attributable to the common cold include cough, runny nose, blocked nose, sore throat, fever, malaise, headache and loss of appetite (7,15,17). The pathology of the nasal mucosa varies depending on the causative organism. Rhinovirus infections are characterized by oedema and hyperaemia with transudative rhinorrhoea (18,21), but without direct damage of the columnar epithelium which is found with influenza virus infection (22). Children who develop viral rhinitis begin with a clear nasal discharge which rapidly becomes mucopurulent. This mucopurulent nasal discharge is commonly seen in colds with little or no change in the bacterial flora (23). Therefore, antibiotics are not indicated, and their empirical use does not provide any clinical benefit (23,24). Several randomized controlled trials carried out in both developing and industrialized countries have shown

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