Evidence for Self-Medication
International Review Journal

Efficacy and tolerability of ambroxol in children

Tobias Mück, PhD

A review summarised extensive clinical, published and as yet unpublished data on the use of ambroxol in children and evaluated the results. Ambroxol was shown to be an effective secretolytic treatment in children with acute and chronic respiratory diseases. Based on the continuous monitoring of ambroxol safety over many years, the drug showed a favourable benefit-risk profile in adults and children of any age.

For over 40 years, ambroxol has been used in acute and chronic cough. Ambroxol is a secretolytic agent and since it is effective and well-tolerated, is frequently used to clear mucus in children and adolescents. The drug reduces the viscosity of mucus and promotes its removal. These mucokinetic and mucociliary effects have been demonstrated in clinical studies [1]. Furthermore, ambroxol has additional pharmacological properties, including anti-inflammatory, antioxidant and local anaesthetic effects [1]. Ambroxol is available in many solid and liquid dosage forms such as tablets, prolonged release capsules, lozenges, syrup and drops. A paediatric syrup is recommended as first choice for children.

Cough especially common in children

Colds and bronchitis are very frequently associated with acute cough. In children, an acute cough lasts an average of 25 days and is sometimes very burdensome for children and parents. The pharmacy is often the first port of call for parents with coughing children. A range of OTC products is available to treat cough – from synthetic active substances such as ambroxol or pentoxyverine to herbal preparations such as ivy leaves or marshmallow root through to homoeopathic and anthroposophical remedies.

Clinical studies with 1300 children [2]

In order to support the evidence-based use of ambroxol particularly in paediatric patients, all the available clinical data on the use of ambroxol in children were evaluated and summarised in a recent review. The article was published in spring 2020 in Multidisciplinary Respiratory Medicine, the official journal of the Italian Pneumological Society (Società Italiana di Pneumologia, SIP) [2]. The data included clinical studies already published as well as those not previously published. These studies were made available in 2014 to the Pharmacovigilance Risk Assessment Committee (PRAC) of the European drug regulatory authorities (EMA) as part of the risk-benefit assessment of ambroxol. The review also considered real world evidence data from recently published pharmacy-based surveys and cohort studies. The evaluated clinical studies, with a total of approximately 1300 children suffering from acute respiratory infections (acute bronchitis, bronchopneumonia) or chronic diseases (such as chronic bronchitis and bronchial asthma), confirmed the secretolytic effectiveness of ambroxol. Both efficacy and tolerability were consistent across all age groups. Open clinical trials with active controls showed that ambroxol was at least as effective or even more effective than the active substances N-acetylcysteine, S-carboxymethylcysteine and sobrerol. Ambroxol was more efficacious in terms of symptom relief in acute and chronic respiratory tract infections and displayed a faster onset of action. In studies performed as add-on therapy to antibiotics, it was shown that ambroxol can exert a synergistic effect with some antibiotics (e.g. beta-lactam antibiotics), which resulted in a more rapid freedom from symptoms than antibiotic treatment alone. Some pathogens produce a biofilm (a type of protective coating) to shield themselves from antibiotics and endogenous defence cells. Studies on anti-biofilm activity demonstrated a new theoretical approach to therapy: ambroxol could thereby help prevent biofilm-dependent respiratory tract infections.

Since the majority of the evaluated studies are not recent and were undertaken before the introduction of GCP, the design of many of them does not conform to current standards. Nevertheless, the large number of patients, study endpoints and results all argue in favour of the efficacy of ambroxol in the licensed indication as a secretolytic agent in acute and chronic bronchopulmonary diseases associated with impaired mucus formation and transport.

The real-world evidence data also taken into account in the review included 3629 patients, of whom more than 244 were

Evid Self Med 2021;1:210019 | https://doi.org/10.52778/efsm.21.0019
Affiliation/Correspondence: Tobias Mück, PhD, Consumer Healthcare Medical Affairs, Sanofi-Aventis Deutschland GmbH, Industriepark Hoechst, 65026 Frankfurt am Main, Germany (tobias.mueck@sanofi.com)

children. These cohort studies and pharmacy-based surveys support the efficacy and tolerability of ambroxol as a non-prescription drug.

Clinical evidence in small children

Taken as a whole, it was shown that – comparable to studies in adults - there is clinical evidence on which to base the use of ambroxol, a secretolytic drug, in paediatric patients with acute cough. That applies to all age groups and could be demonstrated in the cited studies from an age as young as one month. Ambroxol was well tolerated by children in most studies. A few cases of hypersensitivity reactions were seen, but this does not alter the overall positive benefit-risk ratio of ambroxol.

Hence the available data support the efficacy and tolerability of ambroxol in children. The relevant studies are shown as summary tables for the interested reader. The positive benefit-risk profile of ambroxol in adults can thus also be applied to children from infancy upwards. The results therefore support evidence-based self-medication and advice and recommendation in the pharmacy.

Literature

1. Malerba M, Ragnoli B. Ambroxol in the 21st century: pharmacological and clinical update, Expert Opinion on Drug Metabolism & Toxicology 2008;4(8):1119–29, doi: 10.1517/17425255.4.8.1119
2. Kantar A, et al. An overview of efficacy and safety of ambroxol for the treatment of acute and chronic respiratory diseases with a special regard to children. Multidisciplinary Respiratory Medicine 2020;15:511.

Conflict of interest: T. Mück is an employee of Sanofi.

Disclosure: Medical writing and publication funded by Sanofi Aventis Deutschland GmbH.

Information regarding manuscript

Submitted on: 22.12.2020
Accepted on: 22.12.2020
Published on: 16.08.2021