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Review

Anthroposophic medicine in the treatment of pediatric pseudocroup: A systematic review

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ABSTRACT

Background: In Europe only few integrative pediatric wards exists and there are two German hospitals focusing on anthroposophic medicine as part of complementary and alternative medicine (CAM). Whilst the most common pediatric diseases are treated here, pseudocroup patients make up a large group in these hospitals, receiving conventional as well as anthroposophic therapies. However, effectiveness of these therapy concepts mostly based on physicians' experiences but clinical studies are hitherto missing.

Methods: A systematic literature search identifying therapy approaches for pseudocroup in children was conducted in general electronic databases (Cochrane Library, PubMed, OVID) and in CAM-specific databases (CAMbase, CAM-QUEST®, Anthromedics). Search results were screened for anthroposophic therapy options. In addition, anthroposophic guidebooks were handsearched for relevant information.

Results: Among 157 articles fulfilling search criteria one retrospective study, and five experience reports describing anthroposophic treatments were identified. Several medications for the treatment of pseudocroup were mentioned such as Aconitum, Apis, Bryonia, Hepar sulfuris, Lavender, Pyrit, Sambucus and Spongia. During appropriate use no adverse effects were reported.

Conclusion: Anthroposophic medicine harbors a broad spectrum of remedies for the treatment of pseudocroup in children. In particular, Aconitum, Bryonia and Spongia are frequently recommended; however, clinical trials investigating the effectiveness are sparse. Therefore, development and validation of therapy strategies are required.

1. Background

Complementary and alternative medicine (CAM) and particularly anthroposophic medicine is often used by parents in European countries for their children as an adjuvant therapy.[1,2] In fact, 30–50 % of parents reported to use CAM for children suffering from acute and chronic diseases.[3–6] Anthroposophic medicine considers the entire human being in diagnostics and therapies include special anthroposophic medical products, of homeopathic or phyto-pharmaceutic origin, as well as specific anthroposophic non-drug therapies such as movement therapy (e.g. eurythmy), rhythmic massage, art therapies (e.g. music, painting, sculpturing) and psychological approaches (e.g. work on own biography).[7,8] Anthroposophic medicine is an option for outpatients as well as for inpatients. In Germany, there are two hospitals (Gemeinschaftskrankenhaus Herdecke and Filderklinik in Filderstadt) with a pediatric department specialized in anthroposophic medicine.[9] On average approximately 3000 children are hospitalized here per year (2006–2015) and approximately 30 of those suffered from pseudocroup (unpublished data).

Pseudocroup is one of the most common causes of infectious upper airway obstruction and makes up about 15% of respiratory tract diseases in childhood.[10,11] In children under four years pseudocroup accounts for the leading cause of hospitalization.[12] With a ratio of approximately three to two, males are more affected than girls. For pseudocroup a seasonal variation is observed as occurring prevalently in the autumn or winter months.[13,14] The most common etiology of this disease is a virus infection often caused by the parainfluenza virus. Pseudocroup is characterized by an abrupt onset of a distinct cough and

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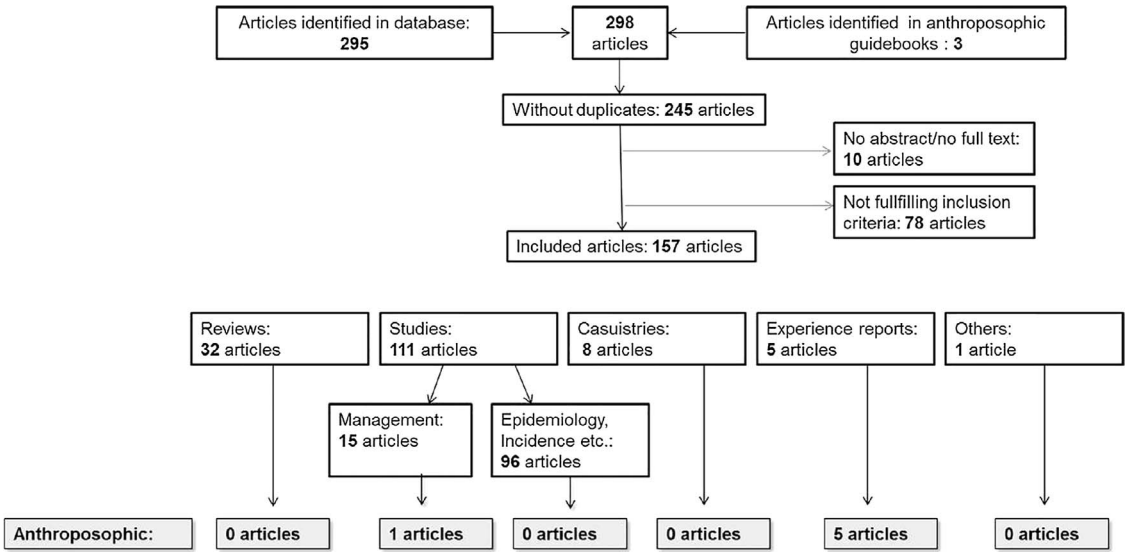

Fig. 1. Flowchart of literature selection process.

can be accompanied by a stridor, a hoarse voice and respiratory distress. In most cases children develop upper respiratory signs and symptoms as well as fever the days before.[12,15] Fortunately, the majority of children suffering from pseudocroup present mild symptoms and in 60%–95% of patients the symptoms disappear within 2–5 days. Standard treatment of pseudocroup comprises administration of additional oxygen, corticosteroids and/or nebulized epinephrine. In fact, intubation is only required in less than 5% of patients.[14,16,17]

Pseudocroup patients in anthroposophic hospitals also receive adjuvant anthroposophic therapies and medications. Here, we provided a review of published literature for anthroposophic therapies treating pseudocroup in children to provide an overview of existing therapies and their effectiveness. Ideally, this research will contribute to develop and to validate treatment strategies.

2. Methods

2.1. Search strategy

General databases (Cochrane Library, PubMed, OVID) as well as CAM-specific databases (CAMbase, CAM-QUEST®, Anthromedics) were screened from their inception to January 2017. Search terms were generated to find literature for pseudocroup in children. The terms were adapted and translated, where necessary, for each database. For example, the terms used in PubMed were: ((viral[title/abstract] AND croup[title/abstract]) pseudocroup[title/abstract] OR "acute subglottic laryngitis"[title/abstract] OR infectious laryngotracheitis[title/abstract]) AND (child[title/abstract] OR children[title/abstract] OR childhood[title/abstract] OR pediatric[title/abstract]). In addition to databases the anthroposophic guidebooks *Vademecum Anthroposophischer Arzeimittel* (Vademecum of anthroposophic remedies),[18] *Pädiatrie integrativ* (Paediatrics integrative),[19] *Individuelle Pädiatrie* (Individual paediatrics)[20] were handsearched for relevant information. Search strategy was developed by the authors, T. Ostermann as well as K. Fetz, and the actual literature search was conducted by the first author, M. Schwermer.

2.2. Selection process

All article types (reviews, studies, casuistries and experience reports) using search terms in a pertinent manner were included. Articles only describing investigations of pseudocroup inducing viruses were excluded. Selection procedure was conducted by two independent reviewers (M. S., T.Z.). In the case of inconsistencies a third reviewer (K.F.) was consulted. All articles written in English or German were included and screened for relevance after initial selection by screening titles and abstracts.

2.3. Data processing

After this thorough selection, publications were classified regarding to article type (review, study, casuistry, or experience report) and then screened for anthroposophic-relevant content. Next, all surveys harboring anthroposophic content were analyzed with respect to publishing year, study type, therapy approach and main outcome. Data extraction was performed by the first author, M. Schwermer.

3. Results

In total, after removing of duplicates 245 articles were retrieved by database screening. 157 articles fulfilled search criteria and further information were found in three anthroposophic guidebooks. Among these records we identified five experience reports (Supplemental Table S1), eight casuistries (Supplemental Table S2), 32 reviews (Supplemental Table S3) and 111 studies (Supplemental Table S4) whereby 15 studies investigated the management of pseudocroup and the others studies investigated the incidence or the epidemiology (Fig. 1). There was also one article presenting the legal condition for the intubation and tracheotomy for children suffering from pseudocroup (Supplemental Table S5). A complete list of articles is presented in supplemental tables S1–S5 regarding to the article type. All articles providing information for the management of pseudocroup were screened for anthroposophic-related therapy options. Here, we found one retrospective study[21] and five experience reports[20–24] (Table 1).

3.1. Retrospective study

In the retrospective study data of 103 inpatients suffering from pseudocroup between 1978 and 1984 in the *Gemeinschaftskrankenhaus Herdecke* were collected. In this study stage (I–IV) distribution and duration time were presented. Most patients (67.7%) were graded as stage II and only 1% was staged as III–IV. Inpatient stay ranged between 1 and 18 days. The majority of patients (44.7%) only stayed at the hospital for one day. In this study, treatment includes the combination preparation, Bryonia/Spongia comp. (WELEDA AG (plc)), containing Apis mellifica 3X (in Europe consistent with D3), Belladonna 3X,