

## Study: Cough Medicines No Good for Children - or Their Parents

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A new study published in the journal *Pediatrics* questions the effectiveness of popular over-the-counter cough medications in children. The study found that cough syrups that used either dextromethorphan or diphenhydramine, two of the most common ingredients in cough remedies, fared no better than a placebo syrup in controlling nighttime coughs and helping children sleep, and in some instances, caused a variety of unwanted side-effects, leading the researchers of the study to suggest that doctors should weigh their options carefully before recommending these remedies.

In the study, scientists at Penn State University recruited 100 children (average age: 4.5 years) with upper respiratory infections (URIs) and divided them into three groups. One group received a syrup containing the active ingredient dextromethorphan; the second group received a syrup containing diphenhydramine; and the third group received a placebo syrup with no active ingredients. All of the children had been suffering cough symptoms for approximately four days.

The children's parents were instructed to administer the syrup 30 minutes before the child was to go to sleep. The parents were also asked to rate their children's symptoms (frequency and severity of cough, ability to sleep, and whether the cough was "bothersome") on a seven-point scale at two intervals: on the day of treatment (immediately before children received the syrup) and 24 hours later.

Comparison of the pretreatment and posttreatment scores found that the frequency of cough, severity of cough, bothersome nature of the cough, and impact of the cough on the child's (and parents') sleep were all significantly lower on the night after the cough syrups were administered - in all three subject groups. "No significant differences were found for any of the outcome measures," whether the children took a syrup containing dextromethorphan, dipheny-dramine, or no cough-fighting ingredients whatsoever. Furthermore, the researchers found, "When the results for these five outcomes were combined, there was no significant difference between treatments." In fact, children given the placebo syrup coughed less frequently than children given syrups containing either active ingredient.

"The medications failed to produce an improvement in the frequency, severity, or bothersome nature of the cough to a greater degree than placebo," the authors wrote. "Important for parents, neither their child's sleep nor their own sleep was significantly better when their child received medication compared with placebo."

Dr. Ian Paul, the study's lead author, drew on the significance of getting a good night's sleep for sick children and their parents - and the ineffectiveness of the medications in improving sleep - in an interview with the BBC.

"Parents often look particularly hard for ways to calm their child's cough at night because parents, too, need sleep to get through their daytime activities," Dr. Paul explained. "Our study specifically evaluated this variable and showed that, not only did children's sleep not improve, but parent's

sleep didn't improve when their child received active medication versus placebo."

In addition to the relative ineffectiveness of the cough remedies compared to the placebo, some adverse effects were noted among children taking cough syrups with one of the active ingredients. According to the researchers, "The only two adverse reactions that approached statistical significance were insomnia in the dextromethorphan arm and drowsiness in the diphenhydramine group."

The authors also noted that in certain situations, diphenhydramine and dextromethorphan both have the potential to be toxic in younger patients. Previous studies have shown that dextromethorphan can produce a variety of adverse effects in children, including hallucinations and muscle disorders, and can be potentially fatal if taken in high doses and in combination with other over-the-counter medications. Similar side-effects have been seen in patients taking large amounts of diphenhydramine.

Some limits to the study were noted, including its subjective nature - parents reported the frequency and severity of their children's coughing. In addition, only a single dose of medication was given to the children, and a no-treatment group was not used in the comparison. Nevertheless, the authors were firm in their assessment that cough remedies that use dextromethorphan or diphenhydramine provide little, if any, benefit over cough syrups that contain no active ingredients. As they noted in their conclusion:

"Diphenhydramine and dextromethorphan are not superior to placebo in providing nocturnal symptom relief for children with cough and sleep difficulty as a result of an upper respiratory infection. Furthermore, the medications given to children do not result in improved quality of sleep for their parents when compared with placebo. Each clinician should consider these findings, the potential for adverse effects, and the individual and cumulative costs of the drugs before recommending them to families."

### *References*

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