

Effect of Dextromethorphan, Diphenhydramine, and Placebo on Nocturnal Cough and Sleep Quality for Coughing Children and Their Parents

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FROM ABSTRACT:

Objectives. To determine whether the commonly used over-the counter medications dextromethorphan [**Robitussin, Vicks 44**] and diphenhydramine [**Benadryl**] are superior to placebo for the treatment of nocturnal cough and sleep difficulty associated with upper respiratory infections and to determine whether parents have improved sleep quality when their children receive the medications when compared with placebo.

Results. For the entire cohort, all outcomes were significantly improved on the second night of the study when either medication or placebo was given.

However, neither [**Benadryl**] nor dextromethorphan [**Robitussin, Vicks 44**] produced a superior benefit when compared with placebo for any of the outcomes studied.

Insomnia was reported more frequently in those who were given dextromethorphan [**Robitussin, Vicks 44**], and drowsiness was reported more commonly in those who were given diphenhydramine [**Benadryl**].

Conclusions. Diphenhydramine [**Benadryl**] and dextromethorphan [**Robitussin, Vicks 44**] 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.

ABBREVIATIONS:

URI, upper respiratory tract infection

DM, dextromethorphan; [**Robitussin, Vicks 44**]

OTC, over-the-counter;

DPH, diphenhydramine; [**Benadryl, an antihistamine, approved by the FDA in 1946**]

PL, placebo.

THESE AUTHORS ALSO NOTE:

“Cough may be the most bothersome symptom for children with upper respiratory tract infections (URIs), and each year results in more ambulatory health care visits than any other symptom in the United States.” **[Interesting]**

“The use of codeine or dextromethorphan (DM) **[Robitussin, Vicks 44]**, the most common over-the-counter (OTC) antitussive, for treatment of cough is not supported by the American Academy of Pediatrics, largely because there is a lack of proven benefit and some potential for toxicity and overdose.”

“Diphenhydramine (DPH) **[Benadryl]**, an OTC antihistamine, is also commonly administered for symptomatic relief in children with URIs.”

“Cough is particularly vexing at night because it often adversely affects sleep for both ill children and their parents with impact on subsequent daytime activities.”

“Giving their children medications that contain either DM **[Robitussin, Vicks 44]** or DPH **[Benadryl]** before bed is often an attempt by parents to improve their own sleep and functioning during the subsequent day.” **[Interesting, drug the child for the benefit of the parent.]**

Consumers spend billions of dollars per year on OTC medications for cough.

“The desire to give or take a medicine commonly outweighs the paucity of sound research on the effect of these drugs or the conditions that require them.” **[Quite Important]**

DPH **[Benadryl]** is an antihistamine that is widely used as a sedative.

Many pediatricians prescribe and many parents administer cough suppressants or antihistamines to relieve symptoms.

These researchers randomly assigned in a double-masked manner study eligible children DM **[Robitussin, Vicks 44]**, DPH **[Benadryl]**, or PL, in standard doses. The drugs were distributed by the pharmacy in a brown paper bag to blind the investigators. Parents were instructed to give the drugs to their children 30 minutes before sleep.

The principle outcome measure was frequency of cough. Change in cough severity, the impact of the cough on sleep for both child and parent, and the bothersome nature of the cough for the child and the parent were secondary outcome measures.

33 children received diphenhydramine **[Benadryl]**, 33 received dextromethorphan **[Robitussin, Vicks 44]**, and 34 received placebo.

RESULTS

“All outcomes [including placebo] showed dramatic improvement.”

[The body is amazing, innate intelligence.]

“When separated by treatment group, no significant differences were found for any of the outcome measures when comparing the effects of DPH [**Benadryl**], DM [**Robitussin, Vicks 44**], and PL.”

“For cough frequency, those who received DPH [**Benadryl**] and DM [**Robitussin, Vicks 44**] had a mean 1.97-point improvement as rated by their parents compared with a mean 2.24-point change for the better in those who received PL,” **[This means the placebo group did better than both drug groups in cough frequency.]**

When the results for the outcomes were combined, “there was no significant difference between treatments.”

The only significant adverse reactions were insomnia in some of the DM [**Robitussin, Vicks 44**] group and drowsiness in some of the DPH [**Benadryl**] group.

Other adverse reactions reported by some in the drug groups included disorientation, dizziness, headache, hyperactivity, insomnia, nervousness, and stomach ache/nausea symptoms.

DISCUSSION

“This investigation sought to determine whether 2 common OTC medications were superior to placebo for the treatment of nocturnal cough as a result of URI.”

“Disappointing was that neither DM [**Robitussin, Vicks 44**] nor DPH [**Benadryl**] was superior to PL for any of the outcomes studied in this trial.” **[Disappointing to the parent because drugs did not show improvement over innate intelligence.] [Disappointing to the drug companies because it means that the OTC drugs for children’s coughs are unwarranted.]**

“The medications failed to produce an improvement in the frequency, severity, or bothersome nature of the cough to a greater degree than PL.”

“Important for parents, neither their child’s sleep nor their own sleep was significantly better when their child received medication compared with PL.”

“This should reassure clinicians and parents that regardless of treatment, the natural history of a URI favors resolution of symptoms with time.” **[Again, this is the body’s innate intelligence at work.]**

"Cough is the most common acute cause for an ambulatory health care visit in the United States and the second most common reason for visits during childhood."

"Schools and child care facilities often do not tolerate a significant cough, and therefore cough leads to missed school for children and/or missed work for parents."

"Given the results of this investigation and the results of other related investigations, it is important to evaluate whether the OTC availability of these substances is benign."

DM [**Robitussin, Vicks 44**] and DPH [**Benadryl**] drugs have toxic side effects.

Standard doses of DM [**Robitussin, Vicks 44**] has been shown to cause dystonia, anaphylaxis, and bullous mastocytosis.

High doses of DM [**Robitussin, Vicks 44**] has been shown to cause dependence, psychosis, mania, hallucinations, ataxia, somnolence [drowsiness or sleepiness], insulin-dependent diabetes, and death, "particularly when DM [**Robitussin, Vicks 44**] is combined with other OTC medications."

"DM [**Robitussin, Vicks 44**] is also a drug of abuse among adolescents."

First-generation antihistamines like DPH [**Benadryl**] have been shown to have adverse effects, including somnolence, restlessness, nervousness, and insomnia.

"Standard doses of DPH [**Benadryl**] have been associated with acute dystonia, impaired driving ability, and an increased risk of serious injury."

Chronic ingestion and overdose [of DPH] [**Benadryl**] have been linked to dependence, psychosis, cardiac dysrhythmias and a prolonged QT interval, rhabdomyolysis, seizures, and death. [**WOW!**]

"This investigation supports the concept that URIs are self-limited illnesses that improve with time."

"It also questions whether common OTC medications have a place in the treatment of these illnesses for children."

"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."

KEY POINTS FROM DAN MURPHY

- 1) Cough is the most bothersome symptom for children with upper respiratory tract infections (URIs) and results in more ambulatory health care visits than any other symptom in the US.
- 2) The use of the most common over-the-counter (OTC) drugs for cough is not supported by the American Academy of Pediatrics because there are no proven benefit and there is potential for toxicity and overdose.
- 3) Parents give their children common OTC cough drugs to improve their own [parent's] sleep and functioning during the subsequent day.
- 4) Consumers spend billions of dollars per year on OTC medications for cough.
- 5) In this study, there was no difference in cough severity or duration, or in the quality of sleep for the child or parent, between giving children drugs of giving them a placebo.
- 6) All outcomes used in this study showed dramatic natural innate improvement in cough with in a day of time.
- 7) The drugs used in this study and other studies have been shown to have toxic side effects, including: insomnia, drowsiness [wow, note they are opposites], disorientation, dizziness, headache, hyperactivity, insomnia, nervousness, restlessness, stomach ache/nausea symptoms, dystonia, anaphylaxis, bullous mastocytosis, dependence, psychosis, mania, hallucinations, ataxia, somnolence [drowsiness or sleepiness], acute dystonia, impaired driving ability, insulin-dependent diabetes, psychosis, cardiac dysrhythmias and rhabdomyolysis, seizures, and death.
- 8) This article shows that URIs are self-limiting illnesses that improves with time and that the drugs commonly given to children for symptoms do not help and are associated with the potential for numerous serious toxic side effects.
- 9) These authors question whether OTC drugs have a place in the treatment of children with cough from URTIs.

SIDE NOTE FROM DAN MURPHY:

Dextromethorphan [**Robitussin, Vicks 44**] works by blocking the N-methyl-D-aspartate receptor (NMDA). This is the receptor that is used by glutamate and aspartate, which are commonly found in packaged and diet foods. This suggests that glutamate and aspartate are involved in the genesis of cough.