

Sipping Warm Water While Relaxing Is Not More Effective Than Relaxing Alone for Relief of Bronchospasm in Asthmatic Children

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ABSTRACT

Children have been encouraged to sip warm water and to sit quietly and relax as a routine first intervention to help them relieve bronchospasm from asthma. The purpose of this study was to compare sipping warm water while relaxing to relaxing alone for the ability of either to improve FEV₁, pulse and respiratory rates, chest score, and cough during acute episodes of bronchospasm. Sixteen asthmatic children 12–18 years of age were evaluated for their response to sipping warm water while relaxing and to relaxing alone during a minimum of two episodes of bronchospasm for each treatment. At the beginning of coughing, wheezing, or a complaint of tightness, an FEV₁, pulse and respiratory rates, chest score, and the presence or absence of cough were recorded. One of the two independent variables was then introduced randomly. Posttreatment assessment was done at the end of the 10-minute period and included the above data. An F-test was applied to the data for analysis of change in the dependent variables for the patients as a group and for individual subjects according to treatment. Neither sipping warm water while relaxing nor relaxing alone relived bronchospasm as determined by changes in FEV₁. In general, there was wide variation in response of the subjects to these interventions, with some subjects having significantly worse FEV₁ scores, increased pulse rates, and worse chest scores after being asked to sip warm water while relaxing. The conclusion of this study is that children need to be evaluated carefully for individual response to even simple interventions. Further research on methods to relieve bronchospasm is warranted.

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INTRODUCTION

CHILDREN HAVE BEEN ENCOURAGED to sip warm water and to sit quietly and relax as a routine first intervention to help them relieve bronchospasm from asthma.⁽¹⁻³⁾ The purpose of this study was to compare sipping warm water while relaxing to relaxing alone for the ability of either to improve FEV₁, pulse and respiratory rates, chest score, and cough during acute episodes of bronchospams.

SUBJECTS AND METHODS

Subjects

The study group consisted of 8 girls and 8 boys who had asthma according to the definition of the American Thoracic Society.⁽⁴⁾ Their ages were 12–18 years (mean 14.2). They were inpatients at the National Jewish Center for Immunology and Respiratory Medicine, and all performed spirometry on a regular basis. The protocol and informed consent were approved by the National Jewish Institutional Review Board. Informed consent was obtained from the parents, and the children agreed to participate.

Protocol

During a minimum of two episodes of bronchospasm for each treatment, each child was evaluated for his/her response to sipping warm water (approximately 44 degree C) while relaxing or to relaxing alone. The order of introduction of the two independent variables was random. At the beginning of coughing, wheezing, or a complaint of tightness, FEV₁ (done with a Vanguard Spirometer), pulse and respiratory rates, chest score based on wheezing, retractions and air exchange, and the presence or absence of cough were recorded. Nurses at this institution routinely follow this protocol for chest score assessment and instruct children to sit quietly and relax while sipping warm water. For the purpose of this study, the nurses introduced the two methods of intervention using standardized approaches to each child. For the warm water variable, the child was told to “Sip this warm water for the next 10 minutes while you take slow deep breaths and relax your shoulders. Try to think of something pleasant,” and for relaxation alone to “Take slow deep breaths and relax your shoulders. Try to think of something pleasant for the next 10 minutes.” Posttreatment assessment was done using the same variables obtained before treatment.

Statistics

Analysis of variance was chosen because it allowed analysis of change in the dependent variables for the subjects as a group and for individual subjects according to treatment.

RESULTS

The FEV₁ values before treatment varied across subjects, but were similar in the two treatment groups: for the warm water group, the mean FEV₁ was 63.8 ± 17.6 , with a median of 59 and a range of 34–105; for the relaxation alone group, the mean FEV₁ was 56.6 ± 18.0 , with a median of 56 and a range of 29 to 94 (Fig. 1). These values indicated that, as a group, these subjects were having episodes of significant airway obstruction before the treatments. Two subjects in each group (F for both groups, P for warm water, and K for relaxation) had FEV₁

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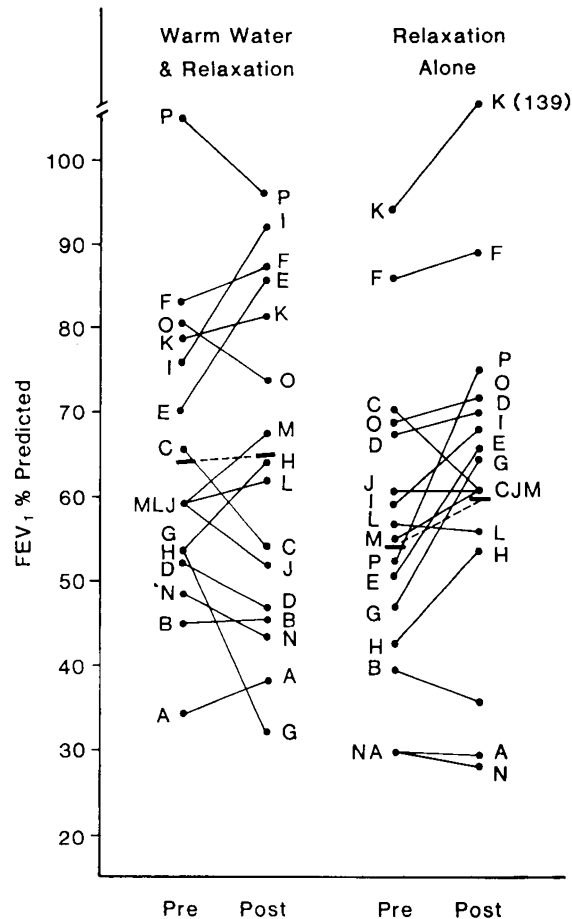


FIG. 1. Pulmonary function before and after relaxation alone or relaxation while sipping warm water. FEV₁ was done using a Vanguard Spirometer; the results of at least two separate episodes for each child for each condition (range 2–7, mean 2.8 ± 1.2) are presented as the percent predicted for the child's sex, age, and height.

values in the normal range before treatment, suggesting that the tightness perceived by these subjects may not have been due to bronchospasm.

The results of FEV₁ before and after sipping warm water while relaxing or relaxing alone demonstrated wide variation in the individual responses to the treatments (Fig. 1). The changes in FEV₁ were not dependent upon the degree of abnormality in the FEV₁ before treatment: for warm water, subjects with FEV₁ < 60% predicted had an average change of -1.4% and subjects with FEV₁ > 60 had a mean change of +1.6%; for relaxation, the values were $\pm 7.9\%$ and $\pm 6.3\%$, respectively. Most subjects had similar changes with each treatment: six had no change with either treatment; four (E, H, I, M) had increases in FEV₁ (>10% of baseline) for both; and one (C) had decreases in FEV₁ (19 and 13% of baseline) for both. And finally, analysis of variance indicated no significant difference in FEV₁ between treatments for the subjects as a group.

There were significant variations in FEV₁ for individual subjects according to treatment ($p = 0.04$). These variations were due to the results in five subjects, G, J, K, O, and P, who all had less response to warm water plus relaxation than to relaxation alone. Subjects G and P had decreases in FEV₁ with warm water (42 and 9% of baseline values) and increases with relaxation alone (38 and 44%, respectively). Subjects J and O had decreases in FEV₁ with warm water (12

and 9%) and no change with relaxation (0 and 4% increase, respectively). And subject K had no change with warm water (4% increase), but an increase with relaxation (48%).

For respiratory rate, there was a significant difference between treatments for subjects as a group (warm water produced no change, but relaxation alone decreased respiratory rate, $p = 0.02$). For chest score, there was a significant difference for individual subjects according to treatment (warm water produced a worse score, while relaxation alone improved chest score, $p = 0.04$). Analysis of variance for changes in pulse rate and cough were not significant between treatments for subjects as a group or for individual subjects according to treatment.

DISCUSSION

Sipping warm water while relaxing has been used as a first intervention for treatment of mild asthma symptoms for many years at National Jewish and in other programs.⁽¹⁻³⁾ The data presented here demonstrate that, in general, neither sipping warm water while relaxing nor relaxing alone relieved bronchospasm, as determined by changes in FEV_1 . Since relaxation alone improved both respiratory rate and chest score significantly, this intervention may be useful as an adjunct to treatment of mild asthma symptoms. It is important to note that for the subjects as a group, the relaxation-induced improvements in respiration rate and chest score were not accompanied by significant improvement in airways obstruction (FEV_1 did not increase significantly). Patients should not be taught that asthma has improved just because the respiratory rate has decreased or they cannot perceive as much wheezing. They must confirm that a subjective feeling of improvement is associated with an improvement in asthma by some objective measure of airways obstruction, such as measurement of peak expiratory flow rate.

There was a wide variation in response of the individual subjects to these interventions. One child (G) had significant improvement with relaxation alone (increased FEV_1 associated with decreases in pulse and respiratory rates and severity of chest score), but was significantly worse after sipping warm water while relaxing (decreased FEV_1 with increases in pulse rate and a worse chest score). Other children had variable responses to the treatments (improved with only 1 of the 2, improved a small amount with both or worse with both). This variability may reflect either placebo effect or nurse rater expectations. However, the results do suggest that "wheezing protocols" should be developed individually for each child.

We conclude that practitioners must evaluate carefully each child's response to even seemingly simple interventions such as sipping warm water or relaxation. Health care providers have gone so far as to recommend that mothers carry a thermos of warm water with them wherever they go. Parents experience multiple stresses in caring for children with chronic illness. Even simple suggestions may place significant added stress on a parent, and interventions should not be suggested unless a clear benefit from them can be demonstrated.

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REFERENCES

1. Newsletter for parents and others in the care of children with asthma: A Community Service Program published by the American Lung Association.
2. Clark NM, Feldman CH, Evans D, et al. Changes in children's school performance as a result of education for family management of asthma. *J School Health* 1984;54:143.

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3. Lewis CE, Rachelefsky G, Lewis MA, et al. A randomized trial of A.C.T. (Asthma Care Training) for kids. *Pediatrics* 1984;74:478.
4. Definition and classification of chronic bronchitis, asthma, and pulmonary emphysema: A statement of the American Thoracic Society. *Am Rev Resp Dis* 1962;85:761.

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