


Effect of Chloroethane Spray in the Treatment of Spastic Torticollis in Children and Adolescents

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Abstract

Objective. A study to determine the efficacy of chloroethane spray compared to normal saline in the treatment of spastic torticollis in children and adolescents. **Hypothesis.** Chloroethane spray is more superior to normal saline for the treatment of spastic torticollis in children and adolescents in the pediatric emergency room. **Design.** Prospective randomized study. **Setting.** Urban inner-city hospital pediatric emergency department. **Methods and Results.** All children and adolescents (between the ages of 1 and 16 years) presenting to the author with the complaint of stiff neck were enrolled in the study. A total of 132 patients were enrolled. After complete evaluation to rule out cervical spine injury, a central neurological cause, patients were enrolled in the study. Sixty-six patients were treated with chloroethane spray to the neck and the other 66 were given normal saline as placebo. Sixty-three out of 66 patients treated with chloroethane spray achieved relief in 5 minutes as demonstrated by painless and free movement of the head and neck. No adverse effects were observed. The patients treated with placebo have no relief in 5 minutes. To test the null hypothesis that the percentages improved in the 2 groups equally, we calculated the Z statistic. The Z statistic of 24 corresponded to a P value of <.0001, whether the test is 1-sided or 2-sided. Chloroethane spray treatment was superior to placebo with a high statistical significance. **Conclusion.** For children and adolescents with spastic torticollis chloroethane spray was more superior to normal saline in the pediatric emergency room.

Keywords

general pediatrics, emergency medicine, critical care, neurology, rheumatology

Introduction

Spastic torticollis, also known as stiff neck or wryneck, is a condition in which the head is laterally flexed and rotated on the neck, secondary to painful spasm of the neck muscles. It is a common presenting complaint in pediatric emergency departments. There may be a report of the patient having slept in a draft from a fan, open window, or air conditioner. The patient is generally afebrile, and if there is any history of trauma, it is of the mildest variety.

Chloroethane (ethyl chloride) spray is a vapocoolant applied topically in the treatment of athletic injuries. The manufacturer indicates that it may be used as a counterirritant in the management of myofascial pain and muscle spasm. The manufacturer reports also that torticollis may be responsive to such treatment.¹ We reviewed the literature and could find no large study on pediatric patients regarding this usage. We report our experience with the use of chloroethane spray treating torticollis in 66 patients ranging in age from 1 to 16 years.

Methods

This is a New York City Health & Hospital Corporation approved prospective randomized study. The total number of subjects were 132. Patients presenting to the pediatric emergency service of a 600-bed inner-city hospital with the complaint of “stiff neck” were selected for treatment. An initial evaluation was performed, which included a medical and family history, a physical examination, and X-ray study of the cervical spine (A-P, lateral, and open mouth views). Patients with any significant radiographic findings were excluded from the study.

The patients were enrolled into either group 1, usage of ethyl chloride spray, or group 2, usage of normal spray. In the patients enrolled in group 1 (after explaining the

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Table 1. Treatment of Acute Spastic Torticollis in Children.

	Positive Response ^a	Negative Response ^b
Patients Rxed with chloroethane spray	63	3
Patients Rxed with normal saline spray	0	66

^aEvidenced by mobility to move the neck freely after 5 minutes.

^bNo response—inability to move the neck freely after 5 minutes.

procedure to the parent and child and obtaining informed consent), the chloroethane spray bottle was held inverted 12 inches directly over the point of maximal neck tenderness. The valve of the bottle was opened, allowing the liquid to leave as a fine jet stream. The stream was left in contact with the skin for 4 to 5 seconds or until frosting of the skin occurred. The procedure was considered successful if, after a 5-minute waiting period, the patient was able to freely and painlessly move his or her head and neck in the opposite side. For the control group, normal saline is applied as a spray using a syringe with plastic catheter over the point of maximum tenderness and asked to move the neck after 5 minutes and note if patient can move the head and neck freely in the opposite side.

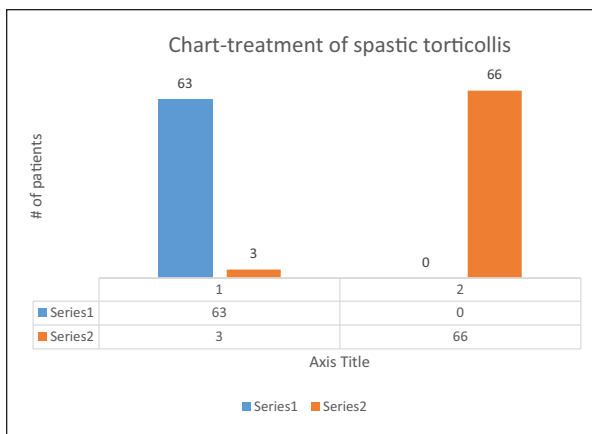
Results

A total of 132 children with a mean age of 8.97 years (range = 1-16 years) presented to the emergency room with torticollis over a period of 3 years and were enrolled in the study. Of the 132, patients in group 1 were treated with chloroethane spray and those in group 2 were treated with normal saline spray. Of the 66 patients treated with chloromethane spray, 63 (95%) responded to the treatment as evidenced by their subsequent ability to move the head and neck freely (see Table 1). There were no adverse effects of this treatment. No patients returned for additional treatment. Of the patients in group 2, who treated with normal saline spray, no patient responded to saline spray with ability to move the head freely in the opposite side (see Figure 1).

The torticollis was in several cases associated with a local head or neck condition, but 46.97% of the cases involved no underlying pathology (Table 2). Of the 3 treatment failures, 2 occurred in patients with neck trauma and 1 failure occurred in a patient with cystic hygroma.

Statistical Analysis

To test the null hypothesis that the percentages improved in the 2 groups equally, we calculated the Z statistic. The Z statistic of 24 corresponded to a *P* value <.0001,

**Figure 1.** Treatment of spastic torticollis.

Blue color: positive response; red color: negative response. Series 1: Patients Rxed with chloroethane spray (63/66 positive response and 3/66 negative response). Series 2: Patients Rxed with normal saline spray (66/66 negative response).

Table 2. Conditions Associated With Spastic Torticollis.

Condition	Number of Cases	Percentage
Cervical lymphadenitis	14	10.8
URI	18	12.64
Otitis media	14	10.6
Minor trauma to neck	12	9.09
Acute pharyngitis	16	6.06
Cystic hygroma	1	0.75
Parotitis	1	0.75
No underlying pathology	64	48.52

Abbreviation: URI, upper respiratory infection.

whether the test is 1-sided or 2-sided. Chloroethane treatment was superior to placebo with high level of statistical significance.

Discussion

Torticollis is a condition in which the head is laterally flexed and rotated on the neck due to shortening or spasm of the sternocleidomastoid muscle. Acquired torticollis can be caused by a variety of problems including cold exposure, minor neck muscle trauma,² and any inflammatory condition of the neck such as cervical lymphadenitis, or retropharyngeal abscess.³ Less common causes include drug ingestion (eg, phenothiazines) and a variety of neurological conditions such as dystonia musculorum deformans, brain stem, or posterior fossa tumor or cyst.⁴ We focus on describing chloroethane treatment for spastic torticollis caused by sternomastoid spasm that may be primary or secondary to a local inflammatory condition.

This form of torticollis is most often treated with warm compresses, analgesics, and muscle relaxants.⁵

Chloroethane spray has been reported to successfully alleviate the neck spasm of adult patients. It is thought that the relief is the result of the wrong acting as a counterirritant or a local anesthetic or by a placebo effect.⁶ Similarly, a vapocoolant therapy has been described to successfully relieve acute myofascial trigger with point pain in children.^{7,8}

Conclusion

In conclusion, from our study, for children and adolescents with spastic torticollis, chloroethane spray was more superior to normal saline in the pediatric emergency room.

Declaration of Conflicting Interests

The author declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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