The Journal of Emergency Medicine, Vol. 46, No. 4, pp. 575–581, 2014

0736-4679/$ - see front matter

ELSEVIER

http://dx.doi.org/10.1016/j.jemermed.2013.08.116

Brief Reports

MANAGEMENT OF BENIGN PAROXYSMAL POSITIONAL VERTIGO: A RANDOMIZED CONTROLLED TRIAL

Regina R. Sacco, DPT, BA, BHSC,* David B. Burmeister, DO,† Valerie A. Rupp, RN, MSN, CRNP,† and Marna Rayl Greenberg, DO, MPH†

*Physical Therapy Department, Lehigh Valley Hospital and Health Network, Allentown, Pennsylvania and †Department of Emergency Medicine, Lehigh Valley Hospital and Health Network, Allentown, Pennsylvania

Reprint Address: Marna Rayl Greenberg, DO, MPH, Department of Emergency Medicine, Lehigh Valley Hospital and Health Network, 1909 Earls Court, Allentown, PA 18103

□ **Abstract—Background: Benign paroxysmal positional vertigo (BPPV) is a common presenting problem. Objective: Our aim was to compare the efficacy of vestibular rehabilitation (maneuver) vs. conventional therapy (medications) in patients presenting to the emergency department (ED) with BPPV. Methods: This was a prospective, single-blinded physician, randomized pilot study comparing two groups of patients who presented to the ED with a diagnosis of BPPV at a Level 1 trauma center with an annual census of approximately 75,000. The first group received standard medications and the second group received a canalith repositioning maneuver. The Dizziness Handicap Inventory was used to measure symptom resolution. Results: Twenty-six patients were randomized; 11 to the standard treatment arm and 15 to the interventional arm. Mean age ± standard deviation of subjects randomized to receive maneuver and medication were 59 ± 12.6 years and 64 ± 11.2 years, respectively. There was no significant difference in mean ages between the two treatment arms ($p = 0.310$). Two hours after treatment, the symptoms between the groups showed no difference in measures of nausea ($p = 0.548$) or dizziness ($p = 0.659$). Both groups reported a high level of satisfaction, measured on a 0–10 scale. Satisfaction in subjects randomized to receive maneuver and medication was 9 ± 1.5 and 9 ± 1.0, respectively; there was no significant difference in satisfaction between the two arms ($p = 0.889$). Length of stay during the ED visit did not differ between the treatment groups ($p = 0.873$). None of the patients returned to an ED for similar symptoms. Conclusions: This pilot study shows promise, and would suggest that there is no difference in symptomatic resolution, ED length of stay, or patient satisfaction between standard medical care and canalith repositioning maneuver. Physicians should consider the canalith repositioning maneuver as a treatment option.** © **2014 Elsevier Inc.**

□ **Keywords—vestibular rehabilitation; benign paroxysmal positional vertigo; ED**

INTRODUCTION

Vertigo is a common complaint of patients who seek care in the emergency department (ED) (1). Vertigo is a frequent symptom in the general population, with a 12-month prevalence of 5% and an incidence of 1.4% in adults; its prevalence rises with age and is about two to three times higher in women than in men (2). Benign paroxysmal positional vertigo (BPPV) is characterized by brief periods of vertigo triggered by a change in the position of a person's head relative to gravity (3). It is the most common disorder, accounting for one third of vestibular diagnoses in the general population (4). It was first described by Barany in 1921 and was later described in more detail by Dix and Hallpike in 1952 (5,6).

It is common practice for ED physicians to treat these patients symptomatically with benzodiazepines, antihistamines, or anticholinergic medications (7). The canalith repositioning maneuver was developed by Epley (8). This

RECEIVED: 5 February 2013; FINAL SUBMISSION RECEIVED: 28 June 2013;
ACCEPTED: 20 August 2013

repositioning maneuver is considered an effective treatment for BPPV (9). However, many existing studies have used a sham/placebo in the comparator arm (10–14).

We set out to compare the efficacy of vestibular rehabilitation vs. conventional therapy in ED patients who present with BPPV. In particular, we sought to evaluate the improvement of vertigo in patients diagnosed with BPPV in the ED, assess their disposition time, and compare patient satisfaction between those patients who receive standard care vs. those who received vestibular rehabilitation.

METHODS

This was a prospective, single-blinded physician, randomized pilot study comparing two groups of patients who presented to the ED with a diagnosis of BPPV at a Level 1 trauma center with an annual census of approximately 75,000. After Institutional Review Board approval and clinical trial registration, we enrolled subjects during weekday hours from February 2006 through December 2009. The first group received standard treatment of medications to alleviate their symptoms, and the second group received vestibular rehabilitation treatment with the canalith repositioning maneuver.

The algorithm for treatment can be viewed in Figure 1. BPPV was diagnosed based on findings obtained from the Dix-Hallpike maneuver (DH) by a blinded physician assessor. We considered the DH test positive, consistent with the literature, when the maneuver elicited reproducible vertigo and exhibited a brief latency period, with fatigability and reversal of the nystagmus on return to upright (15). For purposes of this trial, the nystagmus resolved or fatigued in < 60 s. If the DH test was positive, inclusion and exclusion criteria were applied and the patient was approached for consent and enrollment.

To be included in the study, patients had to be at least 18 years of age, presenting to the ED weekdays during business hours, and have a positive DH test. Patients were excluded if they had taken any antihistamines or anticholinergics within the past 12 h, if they were unable to ambulate, had severe cervical spine disease or known cerebral vascular disease, or had any positive findings during the neurological examination during physical examination that caused concern that the primary diagnosis was not BPPV. Patients were also excluded if they had known Meniere's disease; any cardiac complaints; loss of consciousness; previous enrollment; mental conditions that rendered them unable to understand the nature, scope, and consequences of the study; or were unlikely to comply with the study, such as those with uncooperative attitudes or any other condition that could confound or interfere with evaluation or prevent compliance with the study protocol. Patients who had a negative finding of vertigo and nystagmus when the DH maneuver was performed by the physical therapist or a trained research staff nurse were also excluded, even if the patient had a positive finding of vertigo and nystagmus when the DH maneuver was performed by the physician or resident.

Inter-rater reliability analysis was completed by the physical therapists and nurse researchers before the study using video analysis of nystagmus and post test of technique by a physical therapist certified in vestibular rehabilitation.

After consent and the DH confirmed to be positive with involvement of unilateral or bilateral ears by the therapist/research staff nurse, the patients were randomized into one of the treatment arms using a computer-generated sequence. The control group received medications to alleviate their symptoms as per provider preference, including treatments such as benzodiazepines, antihistamines, antiemetics, and IV fluids. The experimental group received treatment with the canalith repositioning maneuver. The canalith repositioning maneuver was repeated up to two times, if necessary, during the ED visit to attempt full resolution of symptoms.

In both groups, the research staff assessed for symptom resolution every 15 min for the first hour, then every 30 min up to 2 h or until symptom resolution or physician reassessment is complete using a visual analogue scale, one measuring dizziness and another to measure nausea. There was then a repeat assessment of the DH on patients in both groups. Those patients who were in the experimental group who continued to have symptoms at 2 h after treatment with the canalith repositioning maneuver were considered treatment failures and were treated with medications as deemed appropriate by the ED physician. Patients were discharged with either standard instruction for follow-up or, in the case of the intervention group, with instructions to follow-up with physical therapy or a vestibular clinic.

Phone follow-up assessing any repeat ED visits and satisfaction with their treatment, and the Dizziness Handicap Inventory short form (Figure 2) measure was performed (a previously validated tool for measurement of nausea and dizziness on a severity scale) (16).

The study protocol allowed for statistical consultation and data peak power interim analysis conduction to calculate the exact sample size needed to complete the study. The study was terminated at this analysis because the hypothesis had already been tested and changes in prehospital protocols that allowed medications to be given precluded reasonable continued enrollment.

Statistical Methods

Incidence rates and categorical variables were summarized and reported using counts, percentages, and exact