INTRODUCTION

Vertebrobasilar insufficiency testing (VBIT) is commonly used by physical therapists to determine if cervical spine manipulation is contraindicated. Audiologists often include VBIT as a part of vestibular testing in patients with vertigo. In either case, the purpose of VBIT is to determine the adequacy of blood flow to the brain. The maneuver used in VBIT is either a combined extension rotation of the cervical spine or rotation alone. The head rotation is thought to result in compression of the vertebral artery contralateral to the direction of head rotation. VBIT is considered positive if the maneuver elicits any of the symptoms associated with decreased blood supply to the hindbrain including dizziness, vertigo, drop attacks, diplopia, dysarthria, dysphagia, ataxia, nausea, numbness and nystagmus. The diagnostic accuracy and utility of vertebrobasilar insufficiency testing is currently being debated. As a screening test used to determine whether a patient should undergo further radiologic testing to evaluate the patency of the vertebrobasilar system or if a patient can safely proceed with further cervical spine manipulation by a physical therapist, VBIT should have a high sensitivity to minimize the number of false negative results. However, a systematic review by Hutting et al determined that the sensitivity of VBIT is low and ranges from 0 to 57%. VBIT also has a very variable positive predictive value ranging from 0 to 100%. VBIT maneuvers themselves involve manipulation of the cervical spine and could theoretically induce a stroke. Although some studies have shown that VBIT maneuvers can cause changes in blood flow in the vertebral arteries, there is little evidence to suggest that reduced blood flow directly results in symptoms typically associated with vertebrobasilar insufficiency. With questionable diagnostic utility and the potential for harm, it is uncertain if this test should be utilized. This study sought to evaluate the diagnostic utility of vertebrobasilar insufficiency testing in patients referred for evaluation of vertigo.

METHODS

Institutional review board approval was obtained. Retrospective chart review was performed on all adult patients (≥ 18 years of age) who were evaluated for vertigo at one of the Temple University Department of Otolaryngology – Head and Neck Surgery outpatient clinics who also had VBIT performed as a part of videonystagmography (VNG) between January 1, 2011 to February 1, 2014. VBIT maneuvers themselves involve manipulation of the cervical spine and could theoretically induce a stroke. Although some studies have shown that VBIT maneuvers can cause changes in blood flow in the vertebral arteries, there is little evidence to suggest that reduced blood flow directly results in symptoms typically associated with vertebrobasilar insufficiency. With questionable diagnostic utility and the potential for harm, it is uncertain if this test should be utilized. This study sought to evaluate the diagnostic utility of vertebrobasilar insufficiency testing in patients referred for evaluation of vertigo.

RESULTS

Patient Case

39 year old female with a history of migraine headaches who presented with a complaint of daily episodes of vertigo for 2 weeks that started spontaneously and can last up to 1 hour. She experienced nausea and right aural fullness but denied hearing loss, otalgia, otorrhea, or tinnitus. The dizziness is exacerbated by lying down. Physical examination was unremarkable with normal Weber and Rinne tuning fork tests. Patient experienced subjective dizziness on both sides with Dix-Hallpike testing. Audiogram and tympanograms were normal. There were central findings on VNG testing in addition to a positive VBIT. Patient had subsequent MRI brain without contrast and MRA of the head and neck that were negative for vertebrobasilar insufficiency. Patient was subsequently diagnosed and treated for migraine-associated vertigo.

DISCUSSION

Any screening test is only useful if it has a high sensitivity and low false negative rate. VBIT is an inadequate screening test by that measure. MRA is considered the definite test for vertebrobasilar insufficiency. Using MRA as the confirmatory test, the results of this study indicate that VBIT may be no better than a coin toss in helping to determine if a patient should undergo further costly radiologic imaging. Our result is consistent with the findings of other studies that suggest VBIT sensitivity is less than 60%. Another reason to question the use of VBIT as a screening modality is the possibility that the cervical rotation maneuvers used for VBIT could induce a cerebrovascular accident, even though the risk is probably low. When applied to all patients undergoing VNG, VBIT testing does not appear to add additional data to contribute to diagnosis and can possibly result in significant patient morbidity or mortality. For these reasons, VBIT probably should not be used as a criterion for further radiologic testing for vertebrobasilar insufficiency. Limitations of this study include its retrospective nature and the small sample size of patients who had both VBIT and MRA. Further prospective studies involving a larger number of vertigo patients who all have MRAs of the head and neck within a short time after VBIT will provide a more definitive answer to the utility of VBIT as a screening test for vertebrobasilar insufficiency.

CONCLUSION

When applied to all patients undergoing VNG, VBIT testing does not add additional data to contribute to diagnosis, and should not be used as a criterion for further radiologic testing for vertebrobasilar insufficiency.

REFERENCES