HCT Medical Policy

Vestibular Evoked Myogenic Potentials (VEMP) Testing

Policy # HCT115
Current Effective Date: 10/6/2015

Medical Policies are developed by HealthyCT to assist in administering plan benefits and constitute neither offers of coverage nor medical advice. This Medical Policy contains only a partial, general description of plan or program benefits and does not constitute a contract. HealthyCT does not provide health care services and, therefore, cannot guarantee any results or outcomes. Participating providers are independent contractors in private practice and are neither employees nor agents of HealthyCT or its affiliates. Treating providers are solely responsible for medical advice and treatment of members. This Medical Policy may be updated and therefore is subject to change.

Policy Statement

Vestibular evoked myogenic potentials (VEMP) testing for the diagnosis of inner ear dysfunction is considered experimental, investigational and unproven. There is insufficient evidence in the peer reviewed medical literature to conclude that VEMP testing is effective for the diagnosis of inner ear dysfunction or any other application.

Overview

The vestibular evoked myogenic potentials (VEMP) test also known as also known as click evoked neurogenic vestibular potentials is a noninvasive, neurophysiological test used to determine the function of the inner ear otolith organs (i.e. utricle and saccule). The utricle and the saccule are parts of the vestibular system that maintains balance and equilibrium. The function of the otolith organs is to detect linear accelerations and head-tilts in the horizontal plane. The saccule has slight sound sensitivity which can be measured and recorded when sounds are presented to the ear. During VEMP testing, headphones are placed over the ears and small electrodes are attached with an adhesive to the skin over the neck muscles. When sound is transmitted through the headphones, the electrodes record the response of the muscle to the vestibular stimuli. A computer will record several responses from the ear. The audiologist will find the softest level that produces a VEMP response and determine the amplitude and latencies of the response. This test takes approximately one hour and has been investigated to have
diagnostic applications in superior canal dehiscence, benign paroxysmal positional vertigo, Ménière's disease, vestibular schwannoma, vestibular neuritis, otosclerosis, and multiple sclerosis.

Currently, there are no devices for VEMP testing approved by the U.S. Food and Drug Administration (FDA). Auditory brainstem response (ABR) equipment can be modified to perform VEMP testing.

**Scientific Rationale**

There is insufficient evidence in the peer reviewed medical literature to conclude that VEMP testing is effective for the diagnosis and clinical management of inner ear dysfunction. There are no randomized controlled trials, comparative prospective studies or clinical trials that demonstrate VEMP testing improves clinical outcomes. 1-11

In a prospective study, Longo et al (2012) reported the results of VEMPs in 23 patients affected by benign paroxysmal positional vertigo (BPPV) of the posterior semicircular canal (PSC) and 24 controls in order to evaluate the presence of signs of saccular dysfunction compared to the normal population and to correlate them with the clinical picture. All patients underwent complete clinical history and otoneurologic and audiovestibular evaluation consisting of pure-tone audiometry, caloric testing, and registration of VEMPs. VEMP thresholds and latencies were not different between patients and controls. As a group BPPV patients presented significantly higher abnormal VEMPs compared with controls (p < 0.001). The results suggested that age positively correlated with VEMP threshold in the affected ear of patients and in controls; the number of BPPV attacks positively correlated with threshold and negatively with amplitude of VEMPs in the affected ear; duration of the last attack was negatively correlated with the effect of the maneuver performed. 6

Zuniga et al (2012) conducted a prospective cohort study to characterize both cervical and ocular vestibular-evoked myogenic potential (cVEMP, oVEMP) responses to air-conducted sound (ACS) and midline taps in Meniere disease (MD), vestibular migraine (VM), and controls, and determine if cVEMP or oVEMP responses can differentiate MD from VM. Unilateral definite MD patients (n = 20), VM patients (n = 21) by modified Neuhauser criteria, and age-matched controls (n = 28) were included in this study; cVEMP testing used ACS (clicks), and oVEMP testing used ACS (clicks and 500-Hz tone bursts) and midline tap stimuli (reflex hammer and Mini-Shaker). Outcome parameters were cVEMP peak-to-peak amplitudes and oVEMP n10 amplitudes. Relative to controls, MD and VM groups both showed reduced click-evoked cVEMP (p < 0.001) and oVEMP (p < 0.001) amplitudes. Only the MD group showed reduction in tone-evoked amplitudes for oVEMP. Tone-evoked oVEPs differentiated MD from controls (p = 0.001) and from VM (p = 0.007). The oVEPs in response to the reflex hammer and Mini-Shaker midline taps showed no differences between groups (p > 0.210). According to the authors, the results suggested that using these techniques, VM and MD behaved similarly on most of the VEMP test battery.
A link in their pathophysiology may be responsible for these responses. The data suggested a difference in 500-Hz tone burst-evoked oVEMP responses between MD and MV as a group. However, no VEMP test that was investigated in segregated individuals with MD from those with VM. 11

A prospective study by Yang et al (2008) investigated the vestibular evoked myogenic potentials (VEMPs) resulting in benign paroxysmal positional vertigo (BPPV) patients and to verify its clinical applications in BPPV. Forty-one patients with diagnosis of BPPV and 92 healthy volunteers underwent VEMP testing. Patients were treated by canalith repositioning maneuvers according to the affected canal, and testing of VEMP was performed at diagnosis and after treatment. Testing of VEMP was performed in BPPV patients and in the control group. The number of times the canalith repositioning maneuver was repeated until the patient’s report of relief from vertigo and findings of negative positioning test were recorded to find out the relationship between VEMP results and the progress of disease. The authors reported vestibular evoked myogenic potential results of BPPV patients showed prolonged p13 and n23 latencies compared with those of the control group, and we could not find any significant difference in VEMP latencies between patients with posterior and horizontal canal type of BPPV. The number of times that the maneuver was repeated did not correlate with the degree of latency prolongation, but in the “no response” group, the number of times was considerably greater than that in the “response” group. They concluded that VEMP latencies are increased in BPPV patients, which may signify neuronal degenerative changes in the macula of the saccule. When an extensive neuronal damage was suspected by VEMP results such as “no response” in VEMP, the disease progress showed a chronic and resistive course. The results suggested that VEMP could be a useful method to determine a clinical prognosis of patients with BPPV. 10

A prospective controlled clinical study by Akkuzu et al (2006) reported the role of VEMP in benign paroxysmal positional vertigo (BPPV) and Meniere's disease to determine if this type of testing is valuable for assessing the vestibular system. The 62 participants included 17 healthy controls and 45 other subjects selected from patients who presented with the complaint of vertigo (25 diagnosed with BPPV and 20 diagnosed with Meniere’s disease). Vestibular evoked myogenic potentials were recorded in all subjects and findings in each patient group were compared with control findings. Vestibular evoked myogenic potentials for the 30 affected ears in the 25 BPPV patients revealed prolonged latencies in 8 ears and decreased amplitude in 1 ear (9 abnormal ears; 30 % of total). The recordings for the 20 affected ears in the Meniere’s disease patients revealed 4 ears with no response, 6 ears with prolonged latencies (10 abnormal ears; 50 % of total). Only 2 (5.9 %) of the 34 control ears had abnormal VEMP. The rate of VEMP abnormalities in the control ears was significantly lower than the corresponding rates in the affected BPPV ears and the affected Meniere’s ears that were studied (p = 0.012 and p < 0.001, respectively). The results suggested that testing of VEMP is a promising method for diagnosing and following patients with BPPV paroxysmal positional vertigo and Meniere’s disease. 1
A prospective controlled study by Pollack et al (2006) examined the results of VEMP testing in cerebellar and lower-brainstem strokes to determine if VEMP was suitable as a clinical tool to evaluate the extent of cerebellar strokes. In this study, 19 patients with cerebellar ischemic stroke and 15 patients with lower-brainstem ischemic stroke (11 in the pons, 4 in the medulla) were included. The latencies and amplitudes in both groups of patients were compared with those obtained in a control group of 53 normal individuals. No statistically significant VEMP changes were found in patients with lower-brainstem strokes as compared with controls. Therefore, VEMP testing does not appear to be a suitable tool for assessment of brainstem integrity in patients with posterior fossa strokes however, they could constitute a sensitive method for documentation of involvement of the central vestibular pathways in patients with brainstem stroke. 

**Professional Society Guidelines:**

The American Academy of Neurology (2000) Report of the Therapeutics and Technology Assessment indicates that quantitative vestibular testing, whether caloric or rotational, may be used as a confirmatory test when the clinical history and examination suggest vestibular dysfunction. For suspected unilateral peripheral vestibular lesions (e.g., Menière’s or vestibular neuronitis) caloric testing as done with electronystagmography is the most helpful. Patients suspected of having bilateral peripheral vestibular dysfunction (e.g., gentamicin ototoxicity) are best studied using rotational chair testing, though caloric testing is acceptable and AHR shows promise. Passive rotational testing without a motorized chair apparatus shows some promise as an alternative to a rotational chair testing in some instances, but the data in support of this are still limited. AHR techniques appear promising for detecting bilateral peripheral vestibular loss, but there is insufficient evidence to support recommending it to detect unilateral peripheral vestibular loss. Children can be tested using any of the techniques used in adults. There is more variability in the range of normal in children, but caloric and rotational vestibular studies can be performed in children with modest technique modifications. Galvanic vestibular stimulation and click-evoked myogenic potentials are considered investigational techniques. 

The American Academy of Audiology Position Statement on the Audiologist's Role in the Diagnosis & Treatment of Vestibular Disorders does not mention VEMP testing.

**Related Codes**

CPT Code 92700: Unlisted otorhinolaryngological service or procedure

**References**

Peer Reviewed Publications

Professional Organization Information

Proprietary
Copyright © 2014 by HealthyCT, Inc. All rights reserved. No part of this document may be reproduced or transmitted by any means, electronic or mechanical, for use with any entity other than HealthyCT, Inc. without the express written permission of HealthyCT, Inc.

<table>
<thead>
<tr>
<th>Date</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>10/6/2015</td>
<td>Original Version</td>
</tr>
</tbody>
</table>