

Editorial

Cervical Vestibular Evoked Myogenic Potentials and Hypoglossal Nerve Schwannoma

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The cervical vestibular evoked myogenic potential (cVEMP) is a short latency sonomotor response evoked by acoustical, mechanical, or electrical stimulation of the vestibular system. This evoked response was first described by Colebatch and Halmagyi (1992) and can be recorded from the sternocleidomastoid muscle (SCM). There is now general agreement that the peripheral receptor for the cVEMP is the saccule and that its sensitivity to high-intensity acoustical stimulation is due to its close proximity to the middle ear. Once the otoliths have been translated by an acoustical stimulus of sufficient intensity, the saccular afferents are depolarized and these electrical signals are routed through the inferior vestibular nerve to the inferior and medial vestibular nuclei, and from there to the descending medial vestibulospinal pathway to the nucleus of the spinal accessory nerve to cranial nerve XI to terminate on the SCM. If the SCM is being tonically contracted when the saccule is stimulated, a stimulus-evoked reduction in the electromyographic (EMG) activity will occur. When this reduction of stimulus-induced EMG activity is recorded using surface electrodes and then signal averaged, the resulting evoked potential waveform consists of a prominent positive wave that occurs at approximately 13 msec (i.e., referred to as P13). This is followed by a negative-going wave that occurs at approximately 23 msec (i.e., referred to as N23).

Over the last decade, several groups of investigators have demonstrated the clinical utility of the cVEMP for assisting in the identification of posterior fossa tumors. While many types of neoplasms can occur in the posterior

fossa (e.g., gliomas or astrocytomas), the most common is the acoustic neuroma or vestibular schwannoma (VS) which accounts for approximately 90 percent of tumors that grow in the cerebello-pontine angle (CPA). The VS is a non-malignant tumor of cranial nerve VIII that arises from the myelinated Schwann cells of the vestibular nerve. The second most commonly occurring CPA tumor is the meningioma which comprises 10 to 15 percent of all tumors in this region. In this month's issue of the *Journal of the American Academy of Audiology*, Rajasekaran et al (2018) present a case that suggests the cVEMP may also be sensitive to detecting schwannoma's originating from the hypoglossal nerve (CNXII). The hypoglossal nerve innervates the muscles of the tongue. The authors provide clinical evidence illustrating how the cVEMP may assist in identifying those patients with involvement of CNXII. This case is evidence that there is still much to learn about the clinical utility of vestibular evoked myogenic potentials.

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