

## Cervicogenic Vertigo

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There is an increasing body of evidence indicating that not all cases of dizziness or vertigo of cervical origin are due to vertebrobasilar pathology. Receptors in the cervical spine apophysial joints and supporting musculature assume an important role in the maintenance of equilibrium. Afferent impulses originating from mechanoreceptors in the upper cervical spine project to the vestibular nuclei and to the reticular formation of the brain stem.<sup>1-5</sup> Injury to the cervical region may result in a disturbance of the afferent discharge from these receptors and precipitate vertiginous sensations and cervical nystagmus.

DeJong experimentally produced disorientation, imbalance, and in coordination in humans by anesthetizing the dorsal root afferent nerves in the upper cervical region with local anesthetics. These injections produced strong sensations of imbalance and of being pulled toward the side of the injected dorsal roots (impulsion). Test subjects experienced lightheadedness, an empty feeling in the pit of the stomach, a broad-based ataxic gait, and hypotonia of the ipsilateral arm and leg. Also noted in test subjects were a positive Romberg's test with falling or swaying to the side of the injected roots, past-pointing to the same side, and slight unsteadiness of gait after sudden head movements which lasted for several hours postinjection. These local anesthetic injections did not produce dysarthria, intention tremor, dysmetria, dysdiadochokinesia, or disturbances in kinesthesia.<sup>6</sup>

In another study, injection of local anesthetics into the dorsal roots of C1, C2, and C3 in monkeys induced severe alterations of balance, orientation, and motor coordination. Similar injections into the deep cervical musculature of produced nystagmus, severe alterations of balance, disturbed postural orientation, and motor in coordination.<sup>5</sup>

Patients experiencing cervicogenic vertigo may report the following clinical symptoms: positional unsteadiness or giddiness; a feeling that the ground is moving; postural instability noted especially on turning; and imbalance that is markedly enhanced by sudden head movements, such as neck extension with upward or downward gaze or rising from the supine position. Neck pain is always present in patients suffering from cervicogenic vertigo with muscle tenderness, stiffness, and guarding of the cervical region commonly noted. Neck pain may precede the sensations of imbalance by a period of days to months and is commonly located in the occipital region with radiations to the temporomandibular region, the temporal region, and into the arms. Headache complaints are common and occipital in origin with retro-orbital or band-like referred pain patterns. Occasionally patients may complain of numbness in the arms which is apparently without anatomical pattern.<sup>6</sup>

Patients often use the walls for assistance when walking, complain of bumping into objects while walking, and may appear to be hysteric. The imbalance experienced by the patient may be exacerbated by peripheral visual stimulation such as in walking down grocery store aisles, through shopping malls, or riding in cars. A high pitched tinnitus which may be associated with fluctuating hearing loss and a

sensation of fullness in the ear is noted in 30 percent to 60 percent of cases and may suggest cochlear injury.<sup>6</sup>

Oculomotor testing may potentiate complaints of dizziness and during cervical range of motion testing the patient may fail to properly turn the neck. Afflicted patients may turn the entire neck and trunk as a unit in an effort to diminish the firing of cervical afferents which may potentiate dizziness. A useful clinical maneuver to ascertain the presence of cervicogenic vertigo involves placing the patient on a rotating stool, immobilizing the head, and then rotating the neck and trunk under the immobilized head. This maneuver may produce cervical nystagmus which may change direction based on the direction of neck and trunk rotation. It is postulated that this form of nystagmus is due to cervical afferent stimulation rather than from vertebrobasilar arterial insufficiency created by neck rotation. Cervical nystagmus created by neck rotation has an immediate onset whereas nystagmus noted in patients with vertebrobasilar arterial insufficiency is typically noted in susceptible individuals only after the head is rotated into the extremes of rotation and only after a latency period of several seconds to several minutes.<sup>7</sup>

Travell and Simons have demonstrated that trigger point activity in the upper fibers of the trapezius muscle and the clavicular division of the sternocleidomastoid muscle may create symptoms of momentary dizziness and spatial disorientation.<sup>8</sup> Dizziness due to trigger point activity may be initiated by head movements. Thus, dysfunctioning proprioceptors in the cervical musculature or in the apophysial joints may lead to distortion of the normal input to the vestibular nuclei from the cervical region and lead to vertigo or dizziness of cervical origin.

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JANUARY 1995

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