Standing Balance in Persistent Whiplash: A Comparison Between Subjects With and Without Dizziness

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FROM ABSTRACT:

OBJECTIVE: Dizziness and unsteadiness, associated with altered balance, are frequent complaints in subjects suffering persistent whiplash associated disorders.

Research has been inconclusive with respect to possible aetiology.

This study assessed balance responses in subjects with whiplash associated disorders, taking into account several possible causes.

DESIGN: A prospective, 3 group, observational design.

Subjects: 100 subjects with persistent whiplash associated disorders, 50 complaining of dizziness, 50 not complaining of dizziness and 50 healthy controls.

METHODS: The Clinical Test for Sensory Interaction in Balance was performed in both comfortable and tandem stance. [This test requires special equipment, which we have at Life Chiropractic College West].

The sway trace was analysed using wavelet analysis.

CONCLUSION: The results indicated that the energy of the sway signal for comfortable stance tests was significantly greater in the group with dizziness compared with the group without dizziness.

In the group without dizziness the energy was greater than controls for all tests, but significantly different on selected tests.

In selected tandem stance tests, subjects with dizziness were significantly less able to complete the test than subjects without dizziness and controls.

These deficits could not be attributed to medications, compensation, anxiety or age and are likely to be due to disturbances to the postural control system possibly originating from abnormal cervical afferent input. [Key Point]

THESE AUTHORS ALSO NOTE: “Dizziness and/or unsteadiness and episodes of loss of balance are not infrequent complaints of persons with persistent whiplash associated disorders,”
Trauma in whiplash injury may damage the key systems for postural control:
1) The vestibular receptors
2) Cervical spine receptors
3) The central nervous system

Chronic pain may result for altered proprioceptive afferent information into the central nervous system. [Important]

“Chronic symptoms following whiplash injury are thought to arise from abnormal cervical afferent input either from damages or functionally impaired neck joint and muscle receptors.” [Very Important: this is classic description of the subluxation complex and nerve interference].

“Cervical afferent information is important to the control of posture, spatial orientation and co-ordination of the eyes and head.”

The patients in this study had persistent whiplash symptoms lasting at least 3 months.

50 subjects had dizziness or unsteadiness at least twice per week since injury, and the other 50 subjects had no dizziness, but did have other ongoing whiplash symptoms. The authors excluded patients with brain injury, unconsciousness, a pre-whiplash injury history of dizziness, or a history of vestibular pathology such as BPPV.

All subjects were evaluated with computerized posturography to measure their balance and sway with eyes open, eyes closed and under visual conflict.

Subjects were also evaluated for anxiety using the State Train Anxiety Inventory, for pain and disability using the Neck Disability Index, and for current level of pain using the Visual Analogue Scale.

RESULTS
The whiplash patients with dizziness had significantly more pain, disability, and unsteadiness than the whiplash patients without dizziness.

DISCUSSION
“The results of this study confirm that there are deficits in postural responses in those subjects with persistent whiplash associated disorders who do and who do not complain of dizziness and or unsteadiness compared to healthy control subjects.”

Whiplash subjects with dizziness had greater deficits in balance as compared to whiplash subjects without dizziness, and all whiplash patients had greater balance deficits than control subjects.

The results of this study indicate that “age, medication, anxiety, and compensation were not the likely causes of these balance disturbances or the other symptoms of dizziness in subjects with whiplash associated disorders in this study.”
These authors note that there are “neurochemical linkages” and “numerous central interconnections between the balance system and the autonomic nervous system.” [Very Important]

“We contend that our data supports the view that balance disturbances in those with persistent whiplash associated disorders are most likely due to disturbance to the postural control system.” [Very Important]

“The whiplash injury may damage any of the elements important for postural control.” [Very Important]

“The balance disturbances seen in this study could be due to disturbed afferent input from cervical afferents.” [Very Important]

“Disturbances of afferent input from cervical receptors is the more likely primary cause.” [Very Important]

Disturbances in cervical afferent input has been documented in previous studies in chronic whiplash patients with dizziness or unsteadiness, and these patients also have increased joint position error.

“These studies showed that whiplash subjects with dizziness had greater deficits in cervical mechanoreceptor dysfunction than subjects with whiplash not complaining of these symptoms, suggesting that dizziness is caused by a mismatch of abnormal cervical and normal vestibular information.” [Very Important; this is the classic description of the subluxation and nerve interference.]

This study also “supports the notion that the balance deficits are likely to be from a cervical afferent origin.” [Very Important]

“The results of this study have demonstrated deficits in balance in subjects with whiplash associated disorders that are likely to be due to postural control disturbances and not to medication, anxiety and compensation status.” [Very Important]

“In conclusion, this study has determined that balance is disturbed in persons with persistent whiplash associated disorders and that these findings cannot be attributed to age, medication, compensation status or anxiety.” [Important]

“The balance disturbances are likely to be due to disturbed afferent input from cervical receptors.” [Important]

“We advocate that assessment of balance performance should be performed routinely in order to select those subjects with whiplash associated disorder who may benefit from intervention to improve balance and postural control.” [Very Important:

1) We have the equipment to perform balance assessment, as performed in this study, on campus at Life Chiropractic College West.
2) The intervention to improve the abnormal balance and postural control caused by cervical afferent mechanoreceptor dysfunction would require chiropractic spinal adjusting.

KEY POINTS FROM DAN MURPHY

1) Dizziness, unsteadiness, and altered balance are frequent complaints in subjects suffering persistent whiplash associated disorders.

2) Whiplash trauma may damage the key systems for postural control:
   A)) The vestibular receptors
   B)) Cervical spine receptors
   C)) The central nervous system

3) Chronic pain may result for altered proprioceptive afferent information into the central nervous system. [Important]

4) “Chronic symptoms following whiplash injury are thought to arise from abnormal cervical afferent input either from damages or functionally impaired neck joint and muscle receptors.” [Very Important: this is classic description of the subluxation complex and nerve interference].

5) Cervical afferent information is important to the control of posture.

6) Nearly all whiplash-injured patients with chronic symptoms (both with and without dizziness) have disturbed postural responses and balance.

7) The disturbed postural responses and balance problems in chronic whiplash patients is not caused by “age, medication, anxiety, or compensation.”

8) There are “neurochemical linkages” and “numerous central interconnections between the balance system and the autonomic nervous system.” [Important]

9) The balance disturbances seen in this study are due to disturbed afferent input from cervical afferents. The deficits are probably from cervical mechanoreceptor dysfunction causing a mismatch of abnormal cervical and normal vestibular information. [Very Important: this is the classic description of the subluxation and nerve interference.]

10) The assessment of balance should be performed routinely in chronic whiplash patients.

11) We should probably all be evaluating our whiplash-injured patients with the Neck Disability Index and the Visual Analogue Scale.