

RESEARCH ARTICLE: ISCHEMIA
Pain, Dizziness, and Central Nervous System Blood Flow in
Cervical Extension

Vascular Correlations to Beauty Parlor Stroke Syndrome and Salon Sink
Radiculopathy

Prospective study of pain, dizziness, and central nervous system blood flow
in cervical extension.

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FROM ABSTRACT

Objective:

Professional shampoos have previously been implicated in beauty parlor stroke syndrome and salon sink radiculopathy.

The purpose of this study was to record pain, dizziness, and cervical blood flow while subjects were specifically placed into the salon sink position and to determine whether an additional cervical support would alter these symptoms and measurements.

Design:

In 25 volunteers who reported previous dizziness from salon shampoos, we recorded subjective levels of pain and dizziness and objective measurements of blood flow within the vertebral and carotid arteries at baseline and then during cervical extension into a salon sink, with and without additional cervical support.

Results:

When the additional cervical support was not used, there was significantly greater dizziness, neck pain, and carotid blood flow.

No statistically significant differences were seen in the vertebral artery blood flow when comparing the three positions.

Conclusions:

Pain and dizziness were commonly reproduced in this previously symptomatic population but significantly less frequently when a supplemental cervical support was used.

Individuals with a history of such symptoms should probably exercise caution when deciding whether to receive a salon sink shampoo.

THESE AUTHORS ALSO NOTE:

These authors list 21 references that indicate vertebrobasilar ischemia can occur as a result of certain cervical spine positions or movements.

Usually, vertebrobasilar ischemia symptoms occur from cervical extension or rotation.

“The most common symptoms of vertebrobasilar insufficiency are vertigo, nausea, and headache.”

Cervical vertigo is vertigo that has a nonvestibular pathogenesis.

Vertigo caused by compromise of the cervical vertebral artery was first noted in 1957. [Tatlow WFT, Bammer HG: Syndrome of vertebral artery compression. *Neurology* 1957;7:331-40]

In this 1957 study, moving the head and neck together, which would affect the inner ear and vestibular nucleus, did not cause vertigo. However, movement of the head on the neck, which would affect the cervical spine, did cause vertigo.

The authors reference the following activities as causing vertebrobasilar ischemia:

- | | |
|---|-----------------|
| (1) chiropractic manipulation | (5 references) |
| (2) yoga | (2 references) |
| (3) calisthenics | (1 reference) |
| (4) gymnastics | (1 reference) |
| (5) swinging a baseball bat | (1 reference) |
| (6) painting a ceiling | (1 reference) |
| (7) overhead lifting | (1 reference) |
| (8) changing an electric light bulb in an overhead socket | (1 reference) |
| (9) cervical rotation while backing up a truck | (1 reference) |
| (10) cervical extension for radiographic studies | (1 references) |
| (11) cervical extension for a nose bleed | (1 reference) |
| (12) cervical extension at salon sink during a shampoo | (10 references) |

Known as “Beauty Parlor Stroke Syndrome.”

“Authors have proposed that during a salon sink shampoo, the sustained cervical spine position (extension and perhaps rotation) causes compromise of blood flow within the vertebrobasilar arterial system, thus causing ischemic strokes of the posterior intracranial circulation.”

The goal of this study was to assess the blood flow changes within the central nervous system (CNS) when the neck is specifically placed within a salon sink position and to determine whether use of additional neck support would have an impact on this blood flow.

This study used 22 women and 3 men, with an age range of 55–83 yr, and an average age of 72.4, who had a previous history of dizziness or lightheadedness during or shortly after neck extension for a salon sink shampoo.

Diagnostic vascular ultrasound was used to measure blood flow velocity of the vertebral and carotid arteries bilaterally.

Blood flow and symptom status was measured 3 times on each subject, as follows:

- (1) Reclined at 45 degrees with a pillow.
- (2) In cervical extension over a salon sink as if to be shampooed, but with a cervical support device, after holding this position for 12 minutes.
- (3) In cervical extension over a salon sink as if to be shampooed, without a cervical support device, again after holding this position for 12 minutes.

In each position, pain and dizziness were rated using a 0–10 scale, with 0 representing no symptoms and 10 representing maximum symptoms.

There was no cervical rotation in any of the positions used.

“Significantly less pain was reported when using the neck support device than without it.”

“The average pain score was 1.2 when using the support and 5.3 without the support.”

21 of 25 subjects experienced pain without the cervical support (84%).

8 of 25 subjects experienced pain with the cervical support (32%).

Significantly less dizziness was reported when reclining with the neck support device than without it.”

10 of 25 subjects experienced dizziness without the cervical support (40%).

6 of 25 subjects experienced dizziness with the cervical support (24%).

RESULTS:

There was a statistically significant increase in anterior circulation blood flow (carotid artery) in cervical extension when no neck support was used, as compared to cervical extension while using a cervical neck support.

There was no difference in blood flow in the vertebral arteries when comparing baseline values vs. cervical extension with cervical neck support vs. cervical extension without cervical neck support. **[IMPORTANT]**

DISCUSSION

“Pain and dizziness were significantly less while using the additional neck support than without it.”

These authors restate that “multiple previously published articles have reported dizziness as a primary symptom of vertebrobasilar insufficiency” and therefore the increased dizziness noted in these subjects during cervical extension without cervical support “may represent vertebrobasilar ischemia.”

“Blood flow velocity in the anterior circulation was significantly increased when the additional neck support was not used as compared with when it was used.”

These authors “hypothesize that this increased anterior circulation flow may represent compensation for posterior circulation that is pathologically compromised by neck extension without support.”

The authors cite 5 references that note there are collateral flow relationships between the vertebral arteries and the carotid arteries that can be influenced by both extension and rotation.

Importantly, the authors were “surprised that our blood flow measurements in the posterior circulation [vertebral artery] did not show a corresponding decrease to match the increase seen in the anterior circulation [carotid artery]”

The authors cite 2 references of cervical radiculopathy caused or exacerbated by beauty parlor shampoos, called “salon sink radiculopathy,” caused because of encroachment on the nerve root during cervical spine extension.

The authors note that angiography is more accurate than ultrasound to assess blood flow, but it is also more invasive.

The authors note that they used extension for a 12-min duration because “other reports have indicated that sustained ischemia of greater than 15 min seems to be poorly tolerated and may lead to infarct.”

The authors note that “if we had included cervical rotation, the results would have been even more dramatic.”

Symptoms of vertebrobasilar insufficiency often preclude occurrence of a stroke, and therefore stroke risk might be decreased by avoiding positions that compromise the vertebrobasilar circulation [extension and/or rotation].

“Although we hypothesize that the subjects experienced dizziness as a result of vertebrobasilar insufficiency, an alternative explanation is that these symptoms were provoked via nonvascular mechanisms.”

“Some believe the neck position can induce dizziness via altering proprioceptive input.” [Karlberg M, Magnusson M, Malmstrom EM, et al: Postural and symptomatic improvement after physiotherapy in patients with dizziness of suspected cervical origin. Arch Phys Med Rehabil 1996;77:874 –82]

CONCLUSION

“Individuals with signs or symptoms of disease within the cervical spine or posterior CNS circulation should exercise caution regarding cervical positions that may put them at risk for transient or permanent worsening of their condition.”

KEY POINTS FROM DAN MURPHY

- (1) Diagnostic vascular ultrasound is a noninvasive method to determine blood flow through the vertebral and carotid arteries, but is less accurate than angiography.
- (2) Vertebrobasilar ischemia symptoms occur primarily from cervical extension or rotation.
- (3) The most common symptoms of vertebrobasilar insufficiency are vertigo (dizziness), nausea, and headache.
- (4) Symptoms of vertebrobasilar insufficiency may precede a full stroke, indicating cervical extension and or rotation caution is prudent.
- (5) The authors believe that cervical extension for 12-min duration is safer than 15-min duration because of increased risk of ischemia and brainstem infarct.
- (6) Cervical extension with a cervical neck support reduced the incidence of pain and dizziness as compared to cervical extension without a neck support.
- (7) There was no compromise of blood flow through the vertebral arteries while in extension, with or without neck support, even when there was an increase of pain and or dizziness.
- (8) In other words, in this study, the increased dizziness was not caused by compromised blood flow through the vertebral arteries.
- (9) Changes in neck position can cause dizziness by altering proprioceptive input, which to me is a better explanation for the increased dizziness observed in some patients in this study during cervical extension as compared to assuming there was a “compromise of blood flow within the vertebrobasilar arterial system” because the evidence presented is that there was no observed compromise of the vertebral arteries during cervical extension. Also, although these authors reference studies that rule out semicircular canal inner ear genesis of vertigo, these authors did not themselves rule out semicircular canal inner ear of vertigo on any of these 25 volunteers.
- (10) Therefore, the evidence presented suggest that the increased dizziness in extension could be inner ear, altered proprioception, but not vascular compromise.