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The Use of Craniocervical Alignment Procedures in the Management of Brain Deterioration Disorders

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Opinion

During the last 20 years, there has been a significant rise in the prevalence of various brain deterioration diseases and the associated public awareness surrounding such conditions. Labels of cognitive dysfunction can include anything from basic diagnosed conditions such as ADD, ADHD, and various "brain fog" disorders, to the more severe levels of brain and cognitive deterioration such as Dementia, Parkinson's, Alzheimer's, Multiple Sclerosis (MS), Amyotrophic Lateral Sclerosis (ALS), Chronic Traumatic Encephalopathy (CTE), elements of Traumatic Brain Injury (TBI), and Post Traumatic Stress Disorder (PTSD). Yet, as the number of cases of cognitive impairment climbs, determination of definitive causation continues to evade researchers and physicians alike.

When discussing the treatment and management of all cognitive impairment conditions, cerebral hemodynamics is a critical factor that must be considered in ensuring that the brain is receiving and discharging adequate blood flow. If the brain is not receiving adequate blood flow from the arteries, then it will become undernourished and have the potential for deterioration. If the brain is unable to discharge the hypoxic blood out of the brain through the venous system, there is also the potential for deterioration. Inadequacies of the venous drainage system can also cause an increase in the brain's internal vascular pressure which can negatively impact the neurotoxin filtration and removal process of the cerebrospinal fluid (CSF) pump.

The upper cervical spine directly interacts with various elements of the vasculature responsible for providing and maintaining adequate cerebral hemodynamics. The internal carotid artery (ICA) and the internal jugular vein (IJV) are located immediately anterior to the upper cervical vertebrae, and the vertebral artery transcends through the transverse foramen of the upper cervical vertebrae. With numerous research articles demonstrating the potential for vascular alterations due to vertebral structural indenting of the vessels, it appears that abnormal upper cervical alignment may influence cerebral hemodynamics.

Additionally, elongation of the styloid process may affect the ICA and IJV flow and alter cerebral hemodynamics. Whether due to structural elongation or calcification of the stylohyoid ligament, this condition is known as Eagle's Syndrome when the styloid elongation affects regional neurology. Eagle's Syndrome has been noted in medical research journals as a relatively rare occurrence; however, preliminary results of recent large scale research studies appear to be discovering styloid process elongation down to the level of the transverse process of the top cervical vertebra (C1) to be quite common. One preliminary study out of South Carolina in 2021-2022 of 200 cases discovered elongation of the styloid process(es) down to the level of C1 vertebra transverse process at a prevalence of 80% or higher by multiple investigators, and a separate preliminary US national clinical study by multiple investigators of over 3,000 cases from 2017-2020 demonstrated a prevalence of over 50%. It appears that styloid process elongation is much more common than previously thought.

If the styloid process is more commonly developed down to the level of the C1 transverse process, then there are 2 potential vascular compressions that can occur. First, if the C1 vertebra is subluxated (misaligned) in a manner that includes a rotational component, then the transverse process may press the IJV into the backside of the elongated styloid process. Second, if the patient with elongated styloid process(es) spends time in a position of craniocervical flexion, then the styloid process(es) can press back into the IJV causing additional compression.

With the constant neck flexion associated with the technology age of texting, gaming, and computer desk work, the potential increase in IJV compression between a subluxated C1 vertebra and

elongated styloid processes could alter cerebral hemodynamics and may be a significant contributing factor to an increasing prevalence of brain deterioration diseases.

A 2020 study backed by the Rollins School of Public Health currently under peer-review, showed a prevalence of 79% of the cohort had a craniocervical subluxation. This is likely representative of a potentially much larger cohort predisposed to cognitive dysfunction due to an uncorrected craniocervical subluxation. The epidemiological impact of this altered cerebral hemodynamics may extend far beyond presently known morbidity and mortality correlations.

Structural alignment procedures that can effectively improve the vascular compression syndrome of the craniocervical region may have a positive impact on recovery and prevention of degenerative cerebral disorders. The structural alignment procedures focused on correcting the craniocervical alignment are primarily found within the chiropractic profession. Due to the sensitivity of the neurovasculature in the craniocervical region, as well as the anatomical uniqueness of the absence of cervical discs and interlocking posterior facet joints in that region, procedures used to correct craniocervical alignment should be applied gently, non-invasively, and within the patient's normal range of structural motion whenever possible.

Determination of the presence of elongated styloid processes as well as accurate determination of the measurable malposition of craniocervical vertebral alignment and the associated appropriate directional realignment, make diagnostic imaging an essential component for determining the safest and most effective craniocervical alignment procedures. The absence of such imaging could place the practitioner in a position of lacking necessary data for determining appropriate treatment and could increase the potential for patients to experience adverse reactions.

Conclusion

In conclusion, the determination of craniocervical subluxation and the effective use of craniocervical alignment procedures may have a significant and positive effect on improving the cerebral hemodynamics of a large portion of the population and should be a standardized component in the evaluation and management of cognitive dysfunction syndromes.

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