Internal Jugular Vein Compression: A Novel Approach to Mitigate Blast-induced Hearing Injury

A presentation at the 2017 American Association of Neurological Surgeons Annual Scientific Meeting

Los Angeles, Calif. (April 25, 2017) — Winner of the ThinkFirst Injury Prevention Award, Brian D. Sindelar, MD, presented his research, Internal Jugular Vein Compression: A Novel Approach to Mitigate Blast-induced Hearing Injury, during the 2017 American Association of Neurological Surgeons (AANS) Annual Scientific Meeting.

In previous studies, internal jugular vein compression (IJVC) has demonstrated a reduction in axonal and vascular injury associated with traumatic brain injury (TBI) when used as a prophylactic measure. IJVC's effect on not only intracranial, but also intracochlear pressure, was hypothesized to potentiate blast-induced hearing injury (BIHI), and therefore would preclude its use as a prophylactic therapy for TBI.

To test this theory, the authors exposed 20 Sprague-Dawley rats to a right-sided shock wave in which 10 had application of a custom IJVC collar prior to injury. All rodents received baseline and post-blast injury tympanic membrane examination, otoacoustic emissions (OAE) and cochlear histology.

Interestingly, IJVC was shown to significantly reduce tympanic membrane rupture, immediate temporary threshold shifts, permanent threshold shifts at one month from injury and cochlear hair cell destruction in those rats that had application prior to injury exposure.

In this study, IJVC prior to BIHI reduced both functional and structural inner ear pathology in a rodent model. This fascinating study proposes a new prophylactic mechanism that not only provides benefits for TBI mitigation, but also may revolutionize the approach to traumatic hearing injury in both the military and civilian population.

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Founded in 1931 as the Harvey Cushing Society, the American Association of Neurological Surgeons (AANS) is a scientific and educational association with more than 10,000 members worldwide. The AANS is dedicated to advancing
the specialty of neurological surgery in order to provide the highest quality of neurosurgical care to the public. Fellows of the AANS are board-certified by the American Board of Neurological Surgery, the Royal College of Physicians and Surgeons of Canada or the Mexican Council of Neurological Surgery, A.C. Neurosurgery is the medical specialty concerned with the prevention, diagnosis, treatment and rehabilitation of disorders that affect the spinal column, spinal cord, brain, nervous system and peripheral nerves.

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