The Relationship of Tinnitus, TBI, and PTSD in Military Service

Summary by John A. Coverstone, AuD

According to the U.S. Department of Veterans Affairs, tinnitus is the most frequently claimed disability among former service members. Most clinicians specializing in tinnitus care also recognize that bothersome tinnitus frequently includes an underlying psychological condition. Three researchers from the University of Texas Health Science Center in San Antonio sought to investigate and describe the relationship of tinnitus with traumatic brain injury (TBI) and post-traumatic stress disorder (PTSD) from prior research. Their findings were published late in 2017 in the International Society of Behavioral Medicine.

According to the authors, current conflicts in the Middle East have the highest proportion ever of injuries and death from explosive blasts as compared with other combat-related causes. Explosive blasts are the most common cause of TBI. Over half of individuals with TBI also experience tinnitus, and a relationship may exist between the severity of each. In one study of active duty personnel, prior TBIs were correlated with increased likelihood of tinnitus after deployment. This relationship occurred in the absence of other psychiatric disorders. The same study showed that soldiers with a single instance of TBI were 1.8 times more likely to develop tinnitus than those with no TBIs. Soldiers with a history of multiple TBIs were 2.3 times more likely to develop tinnitus.

The authors state that blast exposure is also believed to be the most common cause of PTSD in recent military personnel. One study cited in this review found that brain regions associated with tinnitus have also been linked to psychiatric disorders and may indicate a link between tinnitus and PTSD. Those with both tinnitus and PTSD have reported greater handicap from tinnitus than people having tinnitus comorbid with other psychological health disorders. The authors suggest that PTSD can increase negative reactions to tinnitus and worsen tinnitus perception. They also state that tinnitus can serve to exacerbate PTSD symptoms. They explain that PTSD can cause stimuli present during traumatic events to become associated with natural responses of fear, anxiety, and hopelessness. If tinnitus is caused – or is envisioned as being caused – by the same event that caused PTSD, it may be perceived as a conditioned stimulus and elicit the same reactions.

The authors further point out the ability of tinnitus to disturb sleep, invoke strong autonomic nervous system responses (bodily functions that do not require conscious thought or direction), cause anxiety, and result in irritability from lack of sleep. These reactions to tinnitus overlap the hypervigilance symptoms of PTSD.

In conclusion, tinnitus, TBI, and PTSD often have a shared cause among military personnel, with blast injury being a common event associated with each. The symptoms associated with each condition frequently overlap and may have an additive effect. However, the authors found that more research is needed both to define the physiological and neurological systems involved in each disorder and to develop treatments that address these conditions when they are concurrent.