

Abstract

Objectives. VA audiologists report a substantive increase in the number of Veterans presenting with self-reported hearing problems (primarily difficulty hearing speech in background noise) who demonstrate normal or near normal hearing sensitivity when tested with a standard audiometric test battery. Nearly all of these veterans have reported histories of blast exposure and/or concussion during Operation Iraqi Freedom/Operation Enduring Freedom (OIF/OEF) deployment and describe symptoms consistent with post-concussive syndrome. There are data suggesting that these individuals have below normal poor performance on some tests of central auditory processing and that mild gain open-fit hearing aids result in a reduction in reported difficulties.

Plan. This study will examine the characteristics and nature of this population's auditory and auditory-related skills, and assess whether coexisting post-traumatic stress disorder (PTSD) contributes to their deficits. The study will be conducted in two parts. Part 1 will examine potential levels and mechanisms of breakdown within the auditory system and the role that language processing and executive function might have on performance and self-perceived difficulties. Part 2 will be a preliminary comparative treatment study to evaluate the benefits of fitting mild-gain open-fit hearing aids on patients with normal or near normal pure-tone thresholds but significant and persistent auditory complaints.

Methods. A total of 468 participants will be enrolled into this study from 4 test sites: VA Pittsburgh Healthcare System, VA Sioux Fall Healthcare System, VA Omaha Healthcare System and Portland VA Medical Center. There will be two groups of 117 veterans who report a history of blast exposure and blast-related clinical signs consistent with the VA/DoD definition of mTBI (VA/DoD, 2009), and present with normal or near normal results on standard audiometric testing but who report substantive problems with audition; a group of 117 normal hearing veterans with PTSD but no blast exposure or blast-related clinical signs, and a group of 117 normal hearing controls who report no auditory problems and no histories of blast exposure or brain injury.

In Part 1 of the study a battery of behavioral and physiological measures will be administered in an effort to characterize the level and nature of impairment(s) within the two targeted blast-exposed populations in comparison to the PTSD-only group and the normal controls. Testing will be conducted across four sessions. In session 1 following the informed consent process, inclusion/exclusion testing will be conducted. In session 2 to 4, assessments of the peripheral and central auditory system will be conducted, as well as tests of speech processing in noise and self-report questionnaires.

In Part 2, the benefits of fitting veterans who have mTBI with mild-gain open-fit high-frequency hearing aids will be assessed. Participants will consist of 25 pseudo-randomly selected participants from each of the mTBI groups in Part 1, plus a delayed-treatment control group consisting of participants with mTBI only. The participants will be fitted binaurally with open-fit hearing aid. Behavioral and subjective outcomes will be assessed at 1 week and 6-months post-hearing-aid fitting.

Findings to date: The study has not yet begun therefore no data are available.

Relevance to VA's mission. The information obtained from this study will be another step in elucidating the problems of blast-exposed OEF/OIF Veterans with normal hearing and auditory complaints with and without symptoms of PTSD and it will contribute to our knowledge about effective assessment tools and interventions for this population.

MeSH terms: Traumatic brain injury, Rehabilitation, Auditory Processing Disorder, hearing aids