Injury Risk Assessment and Criteria Development

Epidemiologic Studies of Occupational Blast Exposure

Occupational blast exposure denotes repeated exposures to low-level blast events that occur as part of training and operational activities experienced by personnel in designated roles in the military and law enforcement such as indirect fires (e.g., artillery, mortar), explosive breaching, and anti-armor weapon operation. These exposures are not known to result in acute diagnosable injury, but there has been concern for negative neurologic effects that may be cumulative in nature.

On this hypothesis, two independent teams at Walter Reed Army Institute of Research (WRAIR; Silver Spring, MD) and the Naval Health Research Center (NHRC; San Diego, CA) analyzed archival medical records from more than 275,000 Service members to identify biomedical risks that may present clinically. Each team used military occupational specialty (MOS) codes as a proxy for longitudinal surveillance measurements of chronic exposure.

One research team assessed effects on self-reported symptomology in Post-Deployment Health Assessment (PDHA) records for active duty enlisted Marines, and the other research team examined standard of care diagnosis codes related to neurologic injury for active duty Soldiers. Each study showed evidence for negative effects in hearing ability for these exposed populations, but only the analysis of the PDHA data found evidence for other neurologic risk.

These findings suggest that (1) self-reported symptomology (PDHA) may be a more sensitive measure than standard of care diagnosis codes, and (2) criteria for entries in standard of care medical records may exceed the degree of symptomology present or be limited to those who seek medical attention. Thus, hypothesized risks from occupational exposure may manifest as symptomology not visible in the current medical system. The epidemiological evidence described here may indicate near term opportunities to guide efforts to reduce hearing ability risk among exposed Service members.

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