

Genetic variants may put some soldiers at higher risk of PTSD

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These are US soldiers in training. Credit: US Department of Defense

In a massive analysis of DNA samples from more than 13,000 U.S. soldiers, scientists have identified two statistically significant genetic variants that may be associated with an increased risk of post-traumatic stress disorder (PTSD), an often serious mental illness linked to earlier exposure to a traumatic event, such as combat and an act of violence.

The U.S. Department of Veterans Affairs estimates 11 to 20 percent of veterans from the Afghanistan and Iraq conflicts have or will develop

PTSD. The percentage is even higher among Vietnam War veterans. Prevalence of PTSD in the general U.S. population is 7 to 8 percent.

The findings, described by researchers at University of California San Diego School of Medicine, Veterans Affairs San Diego Healthcare System, the Uniformed Services University and colleagues elsewhere, are published online today in *JAMA Psychiatry*.

The study was designed to discover genetic loci associated with lifetime PTSD risk among U.S. Army personnel. Two coordinated, genome-wide association studies (GWAS) were conducted in two cohorts of consenting soldiers in the Army Study to Assess Risk and Resilience in Servicemembers (Army STARRS). A GWAS is a study that involves rapidly scanning markers across complete sets of DNA or genomes of many people to find genetic variants associated with a particular disease.

The first GWAS was performed on 3,167 diagnosed cases of PTSD and 4,607 trauma-exposed controls from the New Soldier Study; the second on 947 diagnosed cases and 4,969 trauma-exposed controls from the Pre/Post Deployment Study. The primary analysis compared lifetime PTSD cases, as defined by the Diagnostic Service Manual-IV, to trauma-exposed controls without lifetime PTSD.

"We found two notable genetic variants," said co-principal investigator Murray B. Stein, MD, MPH, Distinguished Professor of Psychiatry and Family Medicine and Public Health at UC San Diego. "The first, in samples from African-American soldiers with PTSD, was in a gene (ANKRD55) on chromosome 5. In prior research, this gene has been found to be associated with various autoimmune and inflammatory disorders, including multiple sclerosis, type II diabetes, celiac disease, and rheumatoid arthritis. The other variant was found on chromosome 19 in European-American samples."

There were no significant genetic correlations observed between PTSD and six mental disorders and nine immune-related disorders, said the study's other co-principal investigator Robert J. Ursano, MD, professor and chair of the Department of Psychiatry at Uniformed Services University in Bethesda, Md. But there was significant evidence of pleiotropy—genetic factors that influence multiple traits—for PTSD and rheumatoid arthritis, and to a lesser extent, psoriasis.

"Further research will be needed to replicate the genome-wide significant association we found with the gene ANKRD55 and clarify the nature of the genetic overlap observed between PTSD and [rheumatoid arthritis](#) and psoriasis," said Ursano.

More information: Murray B. Stein et al, Genome-wide Association Studies of Posttraumatic Stress Disorder in 2 Cohorts of US Army Soldiers, *JAMA Psychiatry* (2016). [DOI: 10.1001/jamapsychiatry.2016.0350](#)

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