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New PTSD biotypes enables improved tests, sheds light on divergent treatments efficacy

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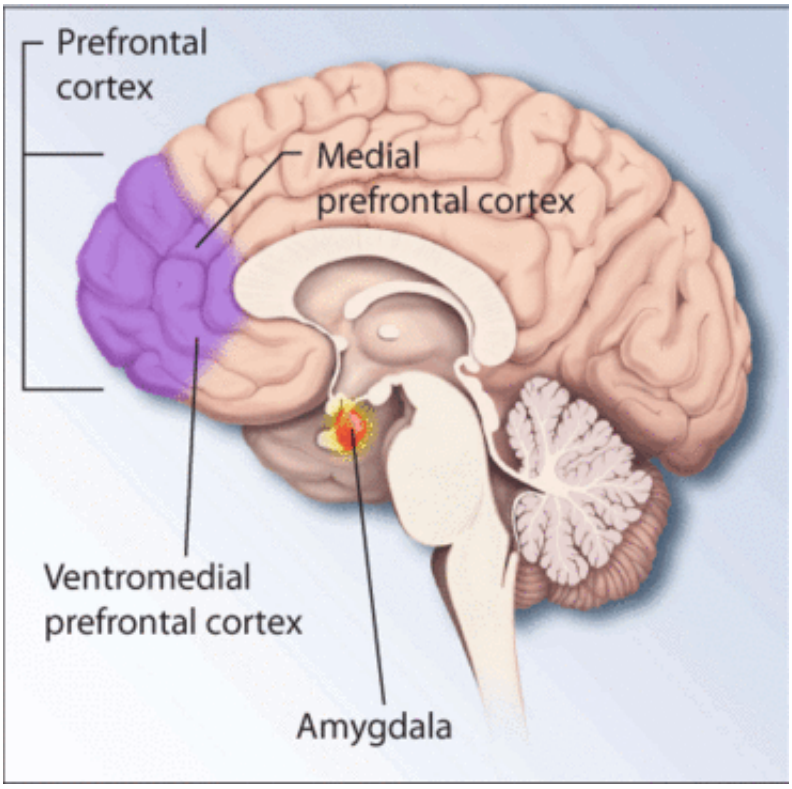

Regions of the brain associated with stress and posttraumatic stress disorder. Credit: National Institutes of Health

Researchers from the PTSD Systems Biology Consortium, led by scientists from the Walter Reed Army Institute of Research, have identified distinct biotypes for post-traumatic stress disorder, the first of their kind for any psychological disorder. "These biotypes can refine the

development of screening tools and may explain the varying efficacy of PTSD treatments," said Dr. Marti Jett, leader of the consortium and WRAIR chief scientist.

Publishing their work in *Molecular Psychiatry* in a manuscript first authored by WRAIR's Dr. Ruoting Yang, researchers used blood tests from male, combat-exposed veterans across a three year period to identify two PTSD biotypes, G1—characterized by mild, inherent co-morbidities typical of PTSD—and G2—which includes more severe symptoms typical of PTSD and report more physical distress—with differing genetic markers and underlying mechanisms of disease. Building on previously published work using machine learning, led by Dr. Francis J. Doyle III, dean of Harvard University's School of Engineering and Applied Sciences and computational lead of the PTSD Systems Biology Consortium, findings were expanded and validated with two additional veteran cohorts and an active-duty cohort.

PTSD diagnosis has long been complicated by a reliance on self-reporting of patient symptoms, particularly the underreporting of signs of distress due to perceived stigma. "These findings help overcome that gap, using data that link objective molecular and physiological measures with PTSD biotypes as a screening tool for early indicators of distress and to avert full, chronic PTSD," explained Dr. Charles Marmar, chair of New York University Langone Health's Department of Psychiatry and clinical lead of the PTSD Systems Biology Consortium.

Additionally, one PTSD medication is currently FDA-approved for use in military personnel and is thought to be approximately 50% effective; clinical trials for other medications are further limited in efficacy. "These data set the stage for physicians to link treatments to specific biotypes, providing a blueprint for targeted therapeutics and better patient outcomes," said Dr. Kerry Ressler, consortium member and chief scientific officer of McLean Hospital.

Researchers with the PTSD Systems Biology Consortium, a network of government and academic laboratories, plan to continue their research to further identify and validate PTSD biotypes to develop better screening tools, including a test to biotype military personnel with probable PTSD symptoms in field settings away from clinicians. Additionally, future studies are planned to incorporate biotyping into clinical trials for PTSD therapeutics currently in development.

More information: Kelsey R. Dean et al, Epigenetic biotypes of post-traumatic stress disorder in war-zone exposed veteran and active duty males, *Molecular Psychiatry* (2020). DOI: 10.1038/s41380-020-00966-2

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