'Brain profiling' to keep suicidal soldiers alive

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This is Professor Talma Hendler of Tel Aviv University. Credit: AFTAU

According to a recent Washington Post study, approximately 20% of U.S. soldiers returning from Iraq and Afghanistan are psychologically damaged. Among them are a substantial number with post-traumatic stress disorder (PTSD), and the high rate of suicide among PTSD sufferers has become unacceptable to Army commanders and the soldiers' families.

Thanks to new research from Tel Aviv University, however, doctors will now be able to forecast a soldier's chances of falling prey to PTSD, with the chance of intervening to prevent military-related suicides.

Prof. Talma Hendler of TAU's Department of Psychology and

Psychiatry and the founding director of the Tel Aviv Functional Brain Center has developed a new predictive tool for detecting at-risk soldiers. The tool will permit clinicians to diagnose and treat these soldiers immediately before the stressors of combat lead to chronic psychological problems. Studying a group of 50 Israeli soldiers — trained medics who experienced extreme stress in live combat zones — Prof. Hendler and her graduate student Roee Admon in collaboration with Col. Dr. Gad Lubin from the Israel Defense Forces were able to predict which soldiers would develop significant increases in stress symptoms such as mood decline, intrusive thoughts, and sleep disturbance.

This May, Prof. Hendler was given a special award from the U.S. Army Commanding General of Medical Research for her advances. The research was published in the August issue of the *Proceedings of the National Academy of Sciences.*

Metering and monitoring stress with an fMRI

Prof. Hendler's research shows functional magnetic resonance imaging (fMRI) can be used to forecast which soldiers might be vulnerable to stress psychopathology in the future. The non-invasive imaging method records the brain activity of military personnel before they enter active duty. Using this baseline as a reference, the researchers can predict which soldier is more prone to exhibit after exposure combat-related stress symptoms -- symptoms that can trigger PTSD or major depression.

The TAU researchers measured the levels of "stress symptoms" twice: first when the soldiers were drafted, then again a year-and-a-half later, during their active duty in combat units. The soldiers were also asked a series of questions evaluating their experience in the army. With this data, researchers developed predictive brain measurements for whether or not a soldier would develop stress.

Having such an early biological marker, says Prof. Hendler, means that diagnosis and treatment can begin immediately following exposure to situational trauma. It is the first fMRI-based study in the world to measure brain activation under stress over a long period of time with respect to prior to stress.

Catching a soldier before he falls

"Looking at the part of the brain called the amygdala, we were able to predict how many stress symptoms of PTSD an individual soldier would develop," says Prof. Hendler. She notes that other brain activity was modified by the stress giving indications of the appropriate intensity and approach of treatment after the stress and trauma set in. Prof. Hendler is currently planning a larger study in this direction.

While Prof. Hendler doesn't believe that the fMRI should be used prejudicially to weed soldiers from certain units, she says that it does give specialists a new set of clues as to how to treat soldiers early and effectively, decreasing the rates of military suicide. This field of science is applied in a growing specialty known as "personalized medicine."

"This tool can help provide tailored therapy to the afflicted and at a very early stage could identify the extreme cases that might otherwise go unnoticed," says Prof. Hendler.

Source: Tel Aviv University (news : web)