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Blast Exposure Induces Post Traumatic Stress Disorder-Related Traits in a Rat Model of Mild Traumatic Brain Injury

To cite this article:

Dr. Gregory Elder, Mr. Nathan P Dorr, Dr. Rita De Gasperi, Dr. Miguel A Gama Sosa, Mr. Michael C Shaughness, Mr. Eric Maudlin-Jeronimo, Mr. Aaron A Hall, Dr. Richard M. McCarron, and Dr. Stephen T Ahlers. Journal of Neurotrauma. -Not available-, ahead of print. doi:10.1089/neu.2012.2510.

Online Ahead of Editing: July 10, 2012

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ABSTRACT

Blast related traumatic brain injury (TBI) has been a major cause of injury in the wars in Iraq and Afghanistan. A striking feature of the mild TBI cases has been the prominent association with post-traumatic stress disorder (PTSD). However, due to the overlapping symptoms distinction between the two disorders has been difficult. We studied a rat model of mTBI in which adult male rats were exposed to repetitive blast injury while under anesthesia. Blast exposure induced a variety of PTSD-related behavioral traits that were present many months after the blast exposure including increased anxiety, enhanced contextual fear conditioning and an altered response in a predator scent assay. We also found elevation in the amygdala of the protein stathmin1, which is known to influence the generation of fear responses. **Since the blast overpressure injuries occurred while animals were under general anesthesia, our results suggest that a blast related mTBI exposure can in the absence of any psychological stressor induce PTSD-related traits that are chronic and persistent. These studies have implications for understanding the relationship of PTSD to mTBI in the population of veterans returning from the wars in Iraq and Afghanistan.**

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