

First study examines PTSD and cognitive impairment in World Trade Center responders

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New research published by the journal *Alzheimer's & Dementia: Diagnosis, Assessment & Disease Monitoring* confirms the connection between posttraumatic stress disorder (PTSD) and cognitive impairment - in this case, among those who helped with search, rescue and cleanup efforts following the 2001 World Trade Center (WTC) attacks.

"To our knowledge, this is the first study to examine the association of PTSD and major depressive disorder (MDD) with cognitive impairment in a large group of civilian World Trade Center responders without head injury," said Sean A. Clouston, Ph.D., first author on the article.

"Cognitive impairment among World Trade Center responders: Long-term implications of re-experiencing the 9/11 terrorist attacks," by Sean A. Clouston, Ph.D., Assistant Professor, Program in Public Health, Health Science Center, Stony Brook University and colleagues, was published online as an article in-press by the journal *Alzheimer's & Dementia: Diagnosis, Assessment & Disease Monitoring*.

In the study population of more than 800 WTC responders:

- Approximately 12.8% (104) had scores indicative of cognitive impairment (CI) and 1.2% (10) had scores suggesting possible dementia.
- Current PTSD and MDD were associated with CI.
- Re-experiencing symptoms (e.g., flashbacks, nightmares) was consistently associated with CI.

Since 2002, more than 33,000 responders have enrolled in a Centers for Disease Control and Prevention-sponsored WTC Health Program.

According to the authors of this new study, if the findings from their group are representative of actual prevalence of CI in the full cohort, results may translate into 3,740-5,300 individuals with CI and 240-810 individuals with dementia.

"These numbers are staggering, considering that the average age of responders was 53 during this study," Clouston said.

"If our results are replicable, doctors need to be aware of the impact of cognitive impairment among individuals who have experienced traumatic events leading to PTSD. For example, cognitive impairment can compound the course of PTSD and depression, impairing the person beyond the impact of PTSD itself," said Clouston. Cognitive impairment and dementia can reduce a person's ability to properly take their medicine, make and attend their appointments, and other important aspects of managing chronic disease.

"This is a problem we must solve," said Maria Carrillo, Ph.D., Alzheimer's Association chief science officer. "The silver lining in these troubling new findings is that they will help us better understand the relationship between PTSD, cognition and dementia. More research is needed in this area. This is crucial so that we can provide better care for all individuals who experience PTSD."

PTSD has been previously linked to cognitive impairment in veterans. A large study of veterans found that PTSD was associated with a two-fold increase in the risk of incident dementia. (Yaffe, et al. Posttraumatic stress disorder and risk of dementia among US veterans. *Arch Gen Psychiatry* 2010.

More About The Study

During the World Trade Center attacks, responders who helped in search, rescue, and recovery endured an array of traumatic and toxic exposures. According to the study authors, one-fifth of these individuals subsequently developed PTSD. In July 2002, the CDC initiated a monitoring and treatment program for WTC responders, spanning five clinical centers. Since then, more than 33,000 responders have enrolled in the WTC Health Program. Stony Brook University (SBU) runs the second largest clinical center, monitoring more than 8,000 responders residing on Long Island, NY.

For this study, trained clinicians screened 818 responders for CI and dementia during monitoring visits at SBU clinics from January 2014 to April 2015. 89.8% completed the screening. On average, SBU responders were 52.8 years old when this sample was taken. Trained clinicians administered the Montreal Cognitive Assessment (MoCA), which consists of multiple short-form tests of reasoning, concentration, problem solving, and memory. Trained psychologists diagnosed both PTSD and MDD.

Additional study findings suggest that:

- Responders with CI had lower education, non-law enforcement occupations (such as construction or utility workers), older age, and were more likely to be current smokers than those without CI.
- For re-experiencing symptoms, longitudinal analyses suggest consistent associations with CI beginning as early as 2002. Notable, baseline severity of re-experiencing symptoms predicted later diagnoses of PTSD and MDD.
- Current PTSD and current MDD remained significantly associated with CI after adjusting for education, occupation, trauma severity, smoking status, hazardous drinking, obesity, hypertension, diabetes and respiratory disease.

Clouston pointed out that, "Our results support research noting the importance of re-experiencing symptoms as an early marker of mental pathology." Re-experiencing symptoms occurs when individuals react physically and emotionally to

memories of past trauma that intrude during daily activities and while asleep. Sleep disturbances are fundamental to PTSD and also have been linked to cognitive decline and dementia.

There are some important limitations to the study acknowledged by the authors.

- The results require validation using comprehensive batteries of cognition and diagnostic evaluations by a trained clinician to diagnose the cause(s) of cognitive impairment in this population.
- These results are limited to study participants who were selected for screening, and, as such, this study does not inform us about the relative risk of other people with similar occupational exposures.
- Although no significant association was found in this study linking head injuries and cognitive impairment, future research should explore whether prior head injury may modify the relationship between PTSD and [cognitive impairment](#).

Provided by Alzheimer's Association

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