Study links poor sleep quality to reduced brain gray matter in Gulf War vets

February 28 2014

A new study of Gulf War veterans found an association between poor sleep quality and reduced gray matter volume in the brain's frontal lobe, which helps control important processes such as working memory and executive function.

"Previous imaging studies have suggested that sleep disturbances may be associated with structural brain changes in certain regions of the frontal lobe," said lead author Linda Chao, associate adjunct professor in the Departments of Radiology and Biomedical Imaging and Psychiatry at the University of California, San Francisco. "The surprising thing about this study is that it suggests poor sleep quality is associated with reduced gray matter volume throughout the entire frontal lobe and also globally in the brain."

Results show that poorer subjective sleep quality was associated with reduced total cortical and regional frontal lobe gray matter volumes after controlling for potentially confounding variables such as posttraumatic stress disorder, depression, Gulf War Illness, trauma exposure and psychotropic medication use. The study may help explain the link between poor sleep quality and impaired psychosocial, physical and occupational functioning.

"This study emphasizes the importance of seeking medical help if you are troubled by the poor quality of your sleep," said American Academy of Sleep Medicine President Dr. M. Safwan Badr. "A board certified sleep medicine physician can identify the cause of your sleep problem

and develop an effective treatment plan for you."

The cross-sectional study was led by senior author Dr. Thomas Neylan, professor in the UCSF psychiatry department and director of PTSD research and deputy associate chief of staff for research at the Department of Veterans Affairs Medical Center in San Francisco. His research team conducted a secondary analysis of imaging and clinical data of 144 Gulf War veterans.

Total cortical, lobar gray matter, and hippocampal volumes were quantified from magnetic resonance imaging (MRI), and subjective sleep quality was assessed with the Pittsburgh Sleep Quality Index (PSQI). Multiple linear regressions were used to determine the association of sleep quality with total and regional brain volumes.

According to the authors, the cross-sectional design of the study did not allow them to determine a causal relationship between sleep and frontal lobe volume. They noted that additional research is needed to determine if effective treatment of disturbed sleep leads to improved structural and functional integrity of the frontal lobes.

Sleep is one of the three key components of health that make up the Performance Triad, Army Medicine's operational approach to help soldiers optimize their own health in order to improve their performance and resiliency.

Provided by American Academy of Sleep Medicine