



EMBARGOED FOR RELEASE:
Dec. 4, 2017
Noon EST
Abstract 349126

MRI Holds Promise for Detecting Potentially Life-Threatening Brainstem Damage, Identifying Those at Risk for Sudden Unexpected Death in Epilepsy (SUDEP)

WASHINGTON, D.C. - Magnetic resonance imaging (MRI) may hold promise for detecting brainstem damage, potentially helping to identify children and adults at risk for sudden unexpected death in epilepsy (SUDEP), suggests research being presented at the [American Epilepsy Society 71th Annual Meeting](#).

Every year 1 in 1,000 adults and 1 in 4,500 children with epilepsy die from SUDEP, in which a person with epilepsy who is otherwise healthy dies suddenly of no known cause. While SUDEP remains a mystery, most of these deaths happen at night and are believed to occur after a seizure. SUDEP may be caused by one of several different mechanisms, experts say. There is no proven treatment to protect against SUDEP, so specialists recommend people with epilepsy try to prevent seizures by taking their antiepileptic drugs (AEDs) as prescribed, getting good sleep and limiting alcohol use.

"Being able to identify people who may be at risk would be significant," said Susanne Mueller, M.D., lead author of the study and associate professor of radiology at the University of California, San Francisco. "While we are a long way from being able to use MRI as a biomarker, this is the first evidence that brainstem damage, one of the mechanisms that has been shown to cause SUDEP in animals, could also play a role in people with epilepsy."

Most people with epilepsy get at least one MRI during their lifetimes, and those with hard-to-treat epilepsy often get several in an attempt to identify a brain abnormality causing the seizures. In the multi-center study, researchers analyzed MRIs of people with epilepsy taken one to 10 years before they died of SUDEP and found the images revealed abnormalities in the parts of the brain that control heart rate and breathing (autonomic function). Research in animals suggests that damage in this area may be caused by seizures that aren't well controlled. If those areas are damaged, the control of these functions may break down, putting people with epilepsy at risk for SUDEP after a seizure.

Researchers studied brain MRI results of 18 living people with epilepsy, 11 healthy people without epilepsy (ages in both groups ranged from 21 to 60 years old) and 27 people who died of SUDEP (ages 1 to 45 years old). They found the living people with epilepsy had mild damage in the mesencephalon in the mid brain, which is involved in autonomic function. Those who died of SUDEP had more extensive damage in that part of the brain, as well as other parts of the brain that control autonomic function, including the medulla oblongata in the brain stem. The study also found that smaller abnormalities in those regions in living people with epilepsy lead to minor disturbances in heart rate variability. Heart rate variability is one of the suspected risk factors for SUDEP.

MRIs of the healthy people did not show damage in those parts of the brain.

“We suspect that if areas of the brain involved in breathing and heart rate are damaged, people who have epilepsy may no longer be able to control these functions properly during a situation of heightened demand, such as a seizure,” said Alica Goldman, M.D., Ph.D., M.S., associate professor of neurology at Baylor College of Medicine, Houston who is a co-author of the study and coordinated efforts that allowed the nationwide collection of MRIs analyzed. “Our hope is that this work and additional research could lead to a method to identify those at risk for SUDEP, and then work to determine the best prevention.”

While the early research holds promise in potentially helping to identify people at risk for SUDEP, it needs to be repeated in a large, prospective study using standardized imaging protocol, the authors note. If future research validates the study, eventually it may be possible to recommend which people with epilepsy should have an MRI, what kind of MRI they should have and how often it should be repeated.

About the American Epilepsy Society

Founded in 1946, the American Epilepsy Society (AES) is a medical and scientific society whose members are dedicated to advancing research and education for preventing, treating and curing epilepsy. AES is an inclusive global forum where professionals from academia, private practice, not-for-profit, government and industry can learn, share and grow to eradicate epilepsy and its consequences.

For more information, visit the American Epilepsy Society online at aesnet.org. Join the AES Annual Meeting social conversation today by following [@AmEpilepsySoc](https://twitter.com/AmEpilepsySoc) on Twitter and use the hashtag #AES2017.

###

CONTACT:

Isabella Jacobs
Public Communications Inc.
O: 202-249-4002
O: 312-558-1770 (after Dec. 6)
ijacobs@pciipr.com

Jennie Szink
Public Communications Inc.
O: 202-249-4002
O: 312-558-1770 (after Dec. 6)
jszink@pciipr.com