

# Brain scans spot possible clues to chronic fatigue syndrome

May 3 2014, by Alan Mozes, Healthday Reporter

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(HealthDay)—Seeking better insight into chronic fatigue syndrome, a new brain scan investigation has pinpointed what could be the first evidence of a connection between nerve cell inflammation and the onset of this debilitating and somewhat mysterious illness, researchers say.

The finding stems from a small PET scan study, led by Yasuhito Nakatomi of the RIKEN Center for Life Science Technologies in Hyogo, Japan. The study involved just nine patients with [chronic fatigue syndrome](#) and 10 healthy participants.

However, the investigators believe that their initial results are the first to show that neuro-[inflammation](#) is a distinct feature of chronic fatigue syndrome. This inflammation affects specific areas of the brain that are

commonly linked with the kind of fatigue, pain, depression, and thought-process difficulties long associated with the syndrome, the researchers noted.

"While the results will need to be confirmed in larger studies, it is a very exciting finding," said Suzanne Vernon, scientific director of the CFIDS (Chronic Fatigue and Immune Dysfunction Syndrome) Association of America. She was not involved with the new study.

"This is the first time images of this type of brain inflammation have been seen in chronic fatigue syndrome," she added, "and provides the evidence of the seriousness and debilitating nature of this disease."

The findings appeared online recently in advance of print publication in the *Journal of Nuclear Medicine*.

The root cause of chronic fatigue syndrome is the subject of much debate. While some health experts believe it is bacteria driven, others think it's most probably brought on by a virus.

The syndrome—which can take hold without warning—is typically characterized by extreme exhaustion, muscle and joint pain, sleep difficulties and thinking problems. The result is often an inability to perform even simple everyday tasks.

In the new study, all the participants first filled out questionnaires that asked them to indicate to what degree they were experiencing any telltale signs of chronic fatigue syndrome.

Brain imaging was then conducted in key areas of the brain, including the cingulate cortex, hippocampus, amygdala, thalamus, midbrain, and pons regions.

All signs of neuro-inflammation were then stacked up against chronic fatigue syndrome symptoms.

The result? While nerve cell inflammation was found to be "widespread" throughout the brains of chronic fatigue syndrome patients, no such inflammation was observed among the healthy study participants.

Vernon said the study also found a graded relationship between levels of inflammation and the severity of disease.

"The higher the inflammation, the more severe the patients' symptoms," she noted.

The study authors further found that neuro-inflammation spiked in patterns that directly correlated with chronic fatigue syndrome symptoms, ratcheting up in brain regions that are central to thought-processes typically impaired by the condition.

That said, Nakatomi's team did not establish a direct cause-and-effect relationship between brain changes and chronic fatigue syndrome. And the finding does not make clear whether such [brain inflammation](#) actually precedes the onset of the condition or occurs as a result.

However, the authors suggested that their work should be viewed as a "proof of concept" that [brain](#) scanning could be a useful way to screen for chronic fatigue syndrome, to both diagnose the disease and assess disease severity on a case-by-case basis.

Dr. Jim Pagel, an associate clinical professor at the University of Colorado Medical School System, said the study findings make sense, and might be most helpful in the context of future research.

"There's no question that chronic fatigue syndrome is a real diagnosis.

It's just a question as to how do you actually make that diagnosis? What is the definition? What are the criteria?" said Pagel, who is also director of the Sleep Disorders Center of Southern Colorado, in Pueblo, Colo.

"And for that I wouldn't say that this work ties PET scans to a clear method for diagnosis, or to any clear treatment approach," he said.

"I really don't think this means that everybody should go out and get a PET scan to diagnose [[chronic fatigue syndrome](#)]," Pagel said. "But at the same time, it doesn't surprise me at all there would be a potential level of nerve inflammation in certain groupings of people with [the condition]. It certainly fits with what we know. And I think this finding will be useful as the research continues."

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Citation: Brain scans spot possible clues to chronic fatigue syndrome (2014, May 3) retrieved 27 April 2024 from

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