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# Schizophrenia could be revealed by distinctive sleep pattern

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When people with schizophrenia sleep, their brain waves show a distinctive pattern that may someday lead to one of the first biological markers for this devastating mental illness.

A team of sleep scientists led by Dr. Fabio Ferrarelli of the University of Wisconsin-Madison found that during non-rapid eye movement sleep (non-REM, or dreamless sleep), the brain waves produced by people with schizophrenia lack the normal pattern of slow and fast spindles.

Someday, use of a common electroencephalogram (EEG) test could confirm suspicions of the disease, or identify young people at risk of schizophrenia.

"Schizophrenia is probably the most devastating chronic mental illness, in terms of its impact on the individual and its cost to society," says Ferrarelli, a researcher in the laboratory of psychiatry professor Dr. Giulio Tononi.

"It's a chronic disease, with a strong genetic component, but we don't have a biological marker to identify patients with schizophrenia. Currently we diagnose these patients according to their symptoms, which vary greatly among individuals."

But in sleep, at least, people with schizophrenia show a similar pattern.

The team used EEG recording to map the full-night brain wave patterns

of 49 people with schizophrenia and 44 healthy people. In addition, they assessed another 20 people who were taking anti-psychotic medication for conditions other than schizophrenia.

About 90 percent of the people diagnosed with schizophrenia showed deficits in sleep spindles, the most common brain waves occurring during non-REM sleep. By contrast, people from the healthy and medicated-but-not-schizophrenic groups showed a regular spindle pattern. The results confirm those from an earlier study.

Another component of non-REM sleep, known as slow waves, didn't vary among the groups.

Co-author Dr. Michael Peterson, assistant professor of psychiatry, says that spindles are mostly produced in the thalamus, a structure in the center of the brain that coordinates incoming stimuli and sends it along to the cerebral cortex. Slow waves are produced mostly in the cortex.

"This study seems to show that the thalamus is particularly important in schizophrenia," Peterson says.

A malfunction in the thalamus could help explain why schizophrenics see and hear things that aren't there.

"If the thalamus doesn't do its job of filtering out unnecessary information, the brain might be unable to ignore stimuli," says Ferrarelli.

This theory lends credence to the idea that brain waves during could be used as a diagnostic test.

"The goal is to find a biological marker that is consistent and related to the fundamental deficits of the disease," Ferrarelli says.

While the research project used an EEG cap with 256 electrodes, only a handful of them are needed to map the crucial brain waves, meaning the test could be performed in most hospitals with an EEG.

**More information:** The study was published in the November edition of the *American Journal of Psychiatry*.

Provided by University of Wisconsin-Madison