

Not enough vitamin B1 can cause brain damage

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A deficiency of a single vitamin, B1 (thiamine), can cause a potentially fatal brain disorder called Wernicke encephalopathy.

Symptoms can include confusion, hallucinations, coma, loss of muscle coordination and vision problems such as double vision and involuntary eye movements. Untreated, the condition can lead to irreversible brain damage and death, according to neurologists at Loyola University Medical Center.

In the developed world, Wernicke [encephalopathy](#) typically occurs in people who have disorders such as alcoholism and anorexia that lead to malnourishment.

Wernicke encephalopathy is an example of the wide range of brain diseases, called encephalopathies, that are caused by metabolic disorders and toxic substances, according to a report by Loyola neurologists Matthew McCoyd, MD, Sean Ruland, DO and Jose Biller, MD in the journal *Scientific American Medicine*.

Acute encephalopathy has a rapid onset of between hours and days. It is commonly due to toxic and metabolic factors.

"Toxic and metabolic encephalopathies may range in severity from the acute confusional state to frank coma," McCoyd, Ruland and Biller write. "As permanent injury may occur, an organized approach is needed to make an accurate and rapid diagnosis."

The hallmark of toxic and metabolic encephalopathies is altered sensorium. This can range from mild attention impairment, such as difficulty spelling a word backwards, to coma.

Toxic encephalopathy can be caused by illegal drugs, environmental toxins and reactions to prescription drugs.

Thiamine deficiency is among the nutritional deficiencies that can cause [brain diseases](#) such as Wernicke encephalopathy. The condition likely is underdiagnosed. Although clinical studies find a rate of 0.13 percent or less, autopsy studies show a prevalence as high as 2.8 percent.

"Particularly in those who suffer from alcoholism or AIDS, the diagnosis is missed on clinical examination in 75 to 80 percent of cases," the Loyola neurologists write.

Untreated, Wernicke encephalopathy can lead to Korsakoff syndrome (KS), characterized by profound memory loss and inability to form memories – patients often can't remember events within the past 30 minutes. Other KS symptoms can include apathy, anxiety and confabulation (fabricating imaginary experiences to compensate for memory loss).

About 80 percent of Wernicke encephalopathy patients develop KS, and once this occurs, only about 20 percent of patients recover.

Wernicke encephalopathy is a medical emergency that requires immediate thiamine treatment, either by injection or IV. "In the absence of treatment, deficiency can lead to irreversible brain damage and death with an estimated mortality of 20 percent," the Loyola neurologists write.

Provided by Loyola University Health System

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