

High fat foods can increase CBD absorption into the body

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While oral cannabidiol (CBD) capsules were approved by the U.S. Food and Drug Administration (FDA) for use in patients with seizures in 2018, very little was known about the effect of food on CBD absorption.

A University of Minnesota study, published in *Epilepsia*, examined whether eating high-fat foods after taking CBD increased the body's absorption of CBD. The study tested whether fasting or a high fat meal has an effect when cannabidiol oral capsules were taken by patients.

To find out what effect a fatty meal would have on CBD absorption, the research group measured CBD concentrations in epilepsy patients at the MINCEP Epilepsy Care clinic who were taking 99 percent pure CBD capsules. Concentrations from patients who took CBD on an empty stomach and a standardized fatty breakfast (i.e. breakfast burrito) were compared.

“The type of food can make a large difference in the amount of CBD that gets absorbed into the body. Although fatty foods can increase the absorption of CBD, it can also increase the variability as not all meals contain the same amount of fat,” said Angela Birnbaum, a professor in the College of Pharmacy and study co-author.

“Increases in the amount of the CBD dose being absorbed into the body can also lead to lower medication costs,” said Ilo Leppik, study co-author, a professor in the College of Pharmacy and an adjunct professor at the Medical School.

The study found:

- CBD exposure is vastly increased when CBD is taken with high fatty foods;
- when compared to fasting, taking CBD with food increased the amount of CBD in the body by four-times and the maximum amount recorded in the participants' blood by 14-times;
- no cognitive differences were identified, which is consistent with previous studies.

“For epilepsy patients, a goal is to maintain consistent blood concentrations of drug,” said Birnbaum. “This study shows that CBD concentrations could vary significantly if patients take it differently, sometimes with or without food. Variations in blood

concentrations could leave a patient more susceptible to seizures.”

This research was funded by the Epilepsy Foundation of America, the Patricia L. Nangle Fund, and a gift from a grateful family. Additional U of M study authors include Susan Marino, College of Pharmacy, Masonic Cancer Center; Christopher Barkley, College of Pharmacy; Rory Remmel, College of Pharmacy, Masonic Cancer Center; Michaela Roslawski, College of Pharmacy; U of M Twin Cities student Ashwin Karanam; and Aden Gramling, University of Minnesota Physicians.

Angela Birnbaum, PhD, FAES, is a professor in the College of Pharmacy. Her research focuses on the variability of drug concentrations and response in topics related to the elderly, pregnant women, children, and drug addiction. Dr. Birnbaum's research includes investigation of epilepsy medications including medical cannabis.

Ilo Leppik, MD, is a professor in the College of Pharmacy and an epilepsy specialist at the University of Minnesota Physicians Epilepsy Care. His research focus includes neurology and epilepsy — specifically around epilepsy in older adults, canine status epilepticus, and treating epilepsy with cannabis.

About the College of Pharmacy

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