

Adolescents who consume a diet high in saturated fats may develop poor stress coping skills, signs of PTSD

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A new study published in the journal *Brain, Behavior, and Immunity* shows that adolescent rats who consume a diet high in saturated fats have

a harder time coping with stress as adults. Moreover, researchers from Loma Linda University in California found that the areas of the brain that handle the fear/stress response were altered to the point that subjects began exhibiting behaviors that mirror post-traumatic stress disorder (PTSD).

"The teen years are a very critical time for brain maturation, including how well (or not) we'll cope with stress as adults," said Dr. Johnny Figueroa, Assistant Professor, Division of Physiology, Department of Basic Sciences and Center for Health Disparities and Molecular Medicine, Loma Linda University School of Medicine. "The findings of our research support that the lifestyle decisions made during adolescence—even those as simple as your diet—can make a big difference in our ability to overcome every day challenges."

The study, "Exposure to an obesogenic diet during adolescence leads to abnormal maturation of neural and behavioral substrates underpinning [fear](#) and anxiety," investigated the impact of an obesogenic Western-like high-saturated fat diet on the development of brain areas involved in responding to fear and stress. Study findings demonstrate that the consumption of an obesogenic diet during adolescence has a profound effect on phasic and sustained components of fear in the adult rat. Notably, the rats that consumed the high-saturated fat diet exhibited more anxiety, problems with associative and non-associative learning processes and an impaired fear-startle response.

Startle reflexes, which are studied in humans and lab animals, have a prominent role in anxiety and PTSD research. In this study, consumption of an obesogenic diet during adolescence reduced the extinction of fear memories—a major impairment observed in people suffering from PTSD. In addition to not properly learning fear associations, the rats on the high-saturated fat diet incorrectly assessed the level of threat. This suggests that obesity and associated metabolic alterations may predispose

individuals to PTSD-related psychopathology.

Researchers reported that the animals in the high-saturated fat diet group exhibited alterations in the structure of brain regions associated with PTSD, including the amygdala and the prefrontal cortex. Notably, the group found that the left-brain hemisphere seems to be more vulnerable to the effects of high-saturated fat diet consumption and obesity-related metabolic alterations. Understanding the neural networks that predispose obese adolescents to developing anxiety and stress-related disorders may help target metabolic measures to alleviate the burden of mental illness in this growing population.

Figueroa said the study leaves other questions open for further investigation, such as replicability in human subjects and if the alterations seen in the brain structures are permanent or whether the effects can be reversed. Study limitations include lack of clarity on how the high-saturated fat diet impacts the adult [brain](#), and whether the effects of the obesogenic [diet](#) on the [fear response](#) are related to deficits in fear memory consolidation, retrieval and expression.

More information: Julio David Vega-Torres et al. Exposure to an obesogenic diet during adolescence leads to abnormal maturation of neural and behavioral substrates underpinning fear and anxiety, *Brain, Behavior, and Immunity* (2018). [DOI: 10.1016/j.bbi.2018.01.011](https://doi.org/10.1016/j.bbi.2018.01.011)

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