

NEWS

High Fructose in Diet Can Impair Cognition

Chronic fructose ingestion is linked to the global epidemic of metabolic syndrome. A lot of studies have been conducted regarding the ill effects of fructose-rich diet as it is the most common sweetener used in all modern sweetened food items. Very little have been studied regarding its direct effects on brain functions regarding its direct effects on brain functions.

High fructose diet is associated with metabolic syndrome. An animal experiment showed that fructose-rich diet can impair cognitive competencies. In this study, two study groups of rats were taken. The first group was given omega-3 fatty acid-rich diet, while the other group was made to drink fructose-rich drink instead of regular water. At the 6-week long experiment, it was found that compared to the control group fed on normal diet and plain water, the omega-3 fatty acid-rich diet rats were faster in completing maze task. The rats drinking fructose, on the other hand, were slower than both groups significantly. Interestingly, the synaptic activity of the brains rats fed with omega-3 fatty acid showed an increased which is critical in learning and memory process. Fructose-fed rats showed a decreased synaptic activity suggesting decreased signaling among brain cells. This led to the interference in

the rats' ability to think clearly and recall the route they had learned 6 weeks earlier. This study strengthens our previous concern about the fructose found in high-fructose corn syrup, usually added to manufacture of food products in the form of a sweetener-cum-preservative.

Recent studies reveal that fructose consumption decreases the levels of the neuronal nuclear proteins such as myelin basic protein, NeuN, and the axonal growth-associated protein 43 concomitant with a decrease in hippocampal weight.^[1] A reduction in peroxisome proliferator-activated receptor gamma coactivator-1 alpha and cytochrome c oxidase subunit II leads to disruption in mitochondrial processes. This triggers a chain of molecular events, unsettling the hippocampal functional plasticity, and hence, specific aspects of learning and memory function. Therefore, cutting down on highly processed, high-fructose foods is a better choice to maintain cognitive capacity.

REFERENCE

1. Jiménez-Maldonado A, Ying Z, Byun HR, Gomez-Pinilla F. Short-term fructose ingestion affects the brain independently from establishment of metabolic syndrome. *Biochim Biophys Acta* 2018;1864:24-33.

VIEWS

Summer Stress

A study conducted on medical students showed that the circulating level of stress hormone "cortisol" is particularly higher in summer. The study was conducted in Poznan University of Medical Sciences in Poland. They studied the seasonal patterns in the cortisol levels in medical students. The study participants were all female students. They were studied on two separate days in the winter and again for two more days in the summer. The saliva samples were collected every 2 h for a full 24-h cycle. Then, the levels of cortisol and markers of inflammation were assessed. Furthermore, the volunteers had to answer lifestyle questionnaire during each testing session which questioned about their sleep schedule, type of diet they followed, and physical activity levels, etc., In this study, the study setting was uniform unlike previous studied where participants were tested in their own homes. In the present study, the cortisol levels were found to be higher in the summer period. However, there was no change in the inflammation

levels between two seasons. Azuma *et al.* previously had shown that symptoms related to dryness related to eye and nose, also general symptoms related to psychological distress among Japanese at the workplace are present in both the seasons. They assessed building-related symptoms among the participants and they too found it was higher in summer. The dryness in the air associated with summer season was an important and significant risk factor for the building-related symptoms and it was associated with other job stressors. Therefore, an improvements in the physical environmental in a job/study setting should be maintained throughout the year which may play an important role in the reduction of psychological distress related to work.

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