

Wang C, Szabo JS, Dykman RA. Effects of a carbohydrate supplement upon resting brain activity. *Integr Physiol Behav Sci* 2004;39:126-38.

ABSTRACT

Glucose is a major energy source for the brain, and along with several monosaccharide derivatives as components of brain gangliosides, they play important roles in neurologic function. However, there is little information available on the role of glucose and other monosaccharides on resting brain activity. This study was designed to evaluate the effects of a single dose of a carbohydrate supplement containing glucose and several of its derivatives on resting brain activity in 20 healthy male college students. The supplement provided an insignificant amount of carbohydrate (3.9 g), protein (0.28 g), fat (0 g), and calories (14 kcal). The amount of glucose in the supplement was 0.5 g (1% the amount of glucose used in adult studies of cognitive functioning and memory). We hypothesized that the glyconutrient supplement would enhance brain activity associated with alertness and attention. The study design was double blind, with subjects randomly assigned to one of two orders, either carbohydrate supplement week

one followed by placebo a week later, or the opposite. Electrical brain activity was monitored by 15 electrodes positioned at nine standard international 10-20 system locations, including three bilateral pairs at frontal, parietal, and occipital sites. Thirty minutes following ingestion of a placebo or carbohydrate supplement drink, EEG activity was recorded for 10-mins while subjects focused on a stationary visual target. Spectral power of resting brain activity was computed and analyzed contrasting the placebo and supplement groups. Relative to placebo, the carbohydrate supplement significantly enhanced power in three brain wave frequencies (theta, alpha and beta) that are known to be associated with attention and arousal. Since changes were observed in the supplement but not in the placebo group, our study suggests that additional sugars in the glyconutritional supplement facilitate enhancement of brain electrical activity. Whether the apparent enhancement of arousal in baseline recordings is associated with improved task performance remains to be determined.