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Benefits of green tea extract to brain connectivity during working memory processing

Green tea extract or its main ingredient has been shown to have a beneficial impact on cognitive functioning and prevention of cognitive decline. The benefit to cognition could be related to altered brain activity in regions engaged during higher order cognitive functioning. Some recent studies demonstrated increased brain activation in the fronto-parietal regions during working memory processing. These findings have generated interest in the connectivity from the parietal to the frontal cortex and the impact of green tea in the functional coupling. The authors conducted a study to explore whether green tea extract changed brain connectivity between the frontal and parietal cortex during working memory processing and if the connectivity parameters were related to task performance. They used a double-blind, counter-balanced, within-subject design to examine 12 healthy volunteers who received a milk whey-based soft drink containing 27.5 g of green tea extract or a milk whey-based soft drink without green tea as a control substance while undergoing functional magnetic resonance imaging. The authors then used dynamic causal modeling to evaluate working memory effect on connectivity between frontal and parietal brain regions. The results showed that green tea extract increased the working memory-induced connectivity from the right superior parietal lobule to the middle frontal gyrus. Of note, the magnitude of green tea-induced increase in parieto-frontal connectivity correlated positively with improvement in task performance. The authors claim that this is the first study to provide evidence of the benefits of green tea on cognitive functioning and, more specifically, on working memory processing. The authors suggest that these findings may have implications regarding the efficacy of green tea for treating cognitive disorders such as dementia.

Schmidt A, Hammann F, Wölnerhanssen B, et al. Green tea extract enhances parieto-frontal connectivity during working memory processing [published online ahead of print March 19, 2014]. *Psychopharmacology*. doi:10.1007/s00213-014-3526-1.

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Controlled trial of transfusions for silent cerebral infarcts in sickle cell anemia

Silent cerebral infarcts are a common complication in sickle cell disease and are often associated with recurrence of infarct or stroke. A silent infarct is undetectable by standard neurological screening and requires more extensive evaluation, such as MRI studies of the brain. Blood transfusion was shown to be an efficacious prevention of stroke in children with sickle cell anemia. The authors conducted a study to test the hypothesis that the incidence of infarct recurrence is lower in children receiving routine transfusion therapy. They conducted a randomized, single-blind clinical trial and assigned children with sickle cell anemia to receive regular blood transfusions or standard of care. The participants ranged

from five to 15 years of age and had a history of at least one silent infarct on MRI. A total of 196 children were followed for three years. The primary end point of recurrence of stroke or new or enlarged silent cerebral infarct occurred at an incidence of two in the transfused group and 4.8 in the observation group. This resulted in an overall incidence rate ratio of 0.41 (95 percent confidence interval, 0.12-0.99; P=0.04). The study concluded that regular blood transfusion therapy significantly reduces the incidence of cerebral infarct recurrence in children with sickle cell anemia. Research is needed to identify those children most at risk for silent infarcts so they can receive transfusion therapy.

DeBaun MR, Gordon M, McKinstry RC, et al. Controlled trial of transfusions for silent cerebral infarcts in sickle cell anemia. *N Engl J Med.* 2014;371:699-710.

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