Ginseng Sharpened Memory in Young Adults

BY CAROLINE HELWICK

FROM THE ANNUAL CONGRESS OF THE EUROPEAN COLLEGE OF NEUROPSYCHOPHARMACOLOGY

AMSTERDAM – American ginseng significantly improved working-memory performance in a double-blind, placebo-controlled crossover study of healthy young adults presented at the congress.

The effects are distinct from those of Asian ginseng, and suggest that psychopharmacological properties depend on the plant's ginsenoside profiles, said Andrew Scholey, Ph.D., professor of behavioral and brain sciences at the Brain Sciences Institute at Swinburne University, Melbourne, Australia.

Dr. Scholey, who led the study, said that previous studies have shown that Asian ginseng (*Panax ginseng*) lowers blood glucose, improves cognitive performance, and alleviates the mental fatigue that is associated with intense cognitive processing.

"American ginseng (*Panax quinquefolius*) shares *Panax*'s glycemic properties, but no previous studies have been conducted to evaluate the capacity of American ginseng to modulate cognitive function," said Dr. Scholey. "The availability of a highly standardized extract of *P. quinquefolius* (Cereboost) led us to evaluate its neurocognitive properties."

The randomized trial involved 32 healthy young adults. Subjects were assessed for acute mood, neurocognitive, and glycemic effects of three doses (100, 200, and 400 mg) of American ginseng (standardized to 10.65% ginsenosides). On study days, separated by at least a 7-day washout period, participants' mood, cognitive function, and blood glucose were measured at 1, 3, and 6 hours after administration of the ginseng.

To measure cognitive effects, investigators used the COMPASS (Computerized Mental Performance Assessment System) battery, which was developed to include tests that have proved sensitive to nutritional manipulations. COMPASS gauges performance on tasks of attention, working memory, secondary memory, and executive function.

The specific cognitive tests included word presentations, immediate word recall, picture presentations, face presentations, simple reaction times, choice reaction times, four-choice reaction times, Stroop color-word task, numeric working memory, alphabetic working memory, Corsi block-tapping task, N-back task, delayed word recall, delayed word recognition, delayed picture recognition, delayed face recognition, serial sevens subtraction task, serial threes subtraction task, and rapid visual information processing or Bakan task.

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American ginseng roots enhanced cognition and mood at several doses.

The study found, for the first time, cognitive and mood enhancements after the administration of American ginseng. Cognition-enhancing effects of the extract were observed across a range of cognitive parameters at a range of doses, reported Dr. Scholey, whose study was published recently (Psychopharamacology 2010 July 31 [doi:10.1007/s00213-010-1964-y]).

"The most striking finding was a significant improvement of working-memory performance," Dr. Scholey reported. Compared with placebo, all doses of the extract were found to improve some aspect of cognition.

For all doses combined, a significant effect of treatment was observed for choice reaction time accuracy ($P = .030$), numeric working memory speed ($P = .007$), speed of alphabetic working memory ($P = .04$), and Corsi block score ($P = .041$). These data represent enhancement effects predominantly on working-memory processes, and to some degree on short-term verbal declarative memory and attention, he said.

No significant baseline differences were found between conditions, showing that post-treatment effects were not attributable to differences in baseline performance, he added.

No differences were seen in blood glucose levels, which rules out the effects of glucose on insulin-mediated mechanisms.

In the published report, the investigators noted that the findings should be treated with a degree of caution. "Firstly, this is the first investigation into the neurocognitive effects of American ginseng. Clearly, the study needs at least partial replication, possibly with more focus on specific working-memory processes. Secondly, given the exploratory nature of the study, no adjustment was made for multiple comparisons," he said. Further research is needed in other populations, such as in older individuals and those with cognitive problems.

The study was sponsored by Naturex, maker of Cereboost. ■

Air Pollutants Tied to Headache Severity

BY SHERRY BOSCHERT

FROM THE ANNUAL MEETING OF THE AMERICAN HEADACHE SOCIETY

LOS ANGELES – Increases in five air pollutants each were linked with increased frequency, severity, or medical consultation rates for headache or migraine in a review of 11 studies from three continents.

The increased risk for headaches is not sufficient to recommend lifestyle changes for individuals on days of high air pollution solely because of the headache risk, but the impact on public health could be large because headache and migraine are prevalent and air pollution is common, Dr. Luzma Cardona said at the meeting.

VITALS

Major Finding: Increases in the outdoor environmental pollutants carbon monoxide, nitrogen dioxide, particulate matter, and sulfur dioxide each were associated with increases in the frequency, severity, or medical consultation rates for headache or migraine.

Data Source: Review of 11 studies of air pollution and headache conducted in North and South America and Europe between 1988 and 2009.

Disclosures: Dr. Cardona said that he and his coauthors have no relevant conflicts of interest.

The U.S. Environmental Protection Agency sets air quality standards for six "criteria" pollutants – carbon monoxide, nitrogen dioxide, particulate matter less than 10 microns in size (PM_{10}), particulate matter less than 2.5 microns in size ($PM_{2.5}$), sulfur dioxide, and lead. High-quality monitoring data on these pollutants are available in many developed countries.

Dr. Cardona and her associates analyzed all studies between 1988 and 2009 in North and South America and Europe that looked at links between these pollutants and headache or migraine. Five of the six pollutants were significantly associated with headache or migraine in more than one study; none of the studies compared outdoor levels of lead and headache. The strongest, most consistent pairing was between nitrogen dioxide and migraine, which were significantly associated in 7 of 11 studies. Sulfur dioxide was significantly associated with "headache not otherwise specified" in 4 of 11 studies, reported Dr. Cardona of the department of neurology at Brigham and Women's/Faulkner Hospital, Boston.

The researchers could not summarize the data quantitatively because of differences between the studies in methods, end points, and outcomes. Of the 11 studies, 2 used symptom diaries to track headache incidence, duration, or severity; 2 looked at medical house calls because of headache; 6 studied emergency department visits; and 1 assessed hospital admissions for headache.

For example, one study in Chile found that the risk of hospitalization for migraine increased 10%-11% for every 1-ppm increase in carbon monoxide, every 29-mcg/m^3 increase in nitrogen dioxide, every 6–parts per billion increase in sulfur dioxide, every 22-mcg/m^3 increase in $PM_{2.5}$, and every 38-mcg/m^3 increase in PM_{10} (Am. J. Epidemiol. 2009;170:1057-66).

In several studies, temperature, humidity, and barometric pressure affected the relationship between pollutants and headache.

Air pollutants might serve as low-level irritants of structures innervated by the trigeminal nerve or trigger headache through other mechanisms, Dr. Cardona noted. ■

Lack of Vitamin D, Ped Headache Linked

BY SHERRY BOSCHERT

FROM THE ANNUAL MEETING OF THE AMERICAN HEADACHE SOCIETY

LOS ANGELES – Vitamin D deficiency was detected in 37% of 497 children and adolescents presenting to a tertiary care center for recurrent headache that required preventive treatment. Vitamin D insufficiency was found in 87%.

These results of routinely measuring baseline serum 25-hydroxyvitamin D (25[OH]D) levels at new or follow-up visits suggest that pediatric patients with recurrent headaches may be at increased risk for vitamin D insufficiency or deficiency compared with the general healthy population, Dr. Hope L. O'Brien and her associates reported in a poster presentation at the meeting.

Vitamin D deficiency was defined as a serum 25(OH)D level of less than 20 ng/mL. Vitamin D insufficiency was defined as a level below 30 ng/mL. Serum 25(OH)D levels averaged 24 ng/mL in patients presenting with episodic migraine and 23 ng/mL in those with chronic migraine, reported Dr. O'Brien of the University of Cincinnati.

A few studies have suggested a possible link between low vitamin D levels and migraine or chronic tension-type headache in adults, but this may be the first study to assess the association in children and adolescents. Patients in the current study had a mean age of 14 years (range 4-25 years).

The finding's implications are unclear, but vitamin D supplementation might help improve headaches and overall health, Dr. O'Brien said. Studies in adults have linked low vitamin D levels with various chronic medical problems such as heart disease, diabetes, cancer, autoimmune disease, chronic pain, and osteoporosis.

Dr. O'Brien did not list any disclosures and did not respond to attempts to contact her. ■