

Ganio et al, 2011 – Mild dehydration impairs cognitive performance and mood of men.

Armstrong et al, 2012 – Mild dehydration affects mood in healthy young women.



Summary provided by Harris R. Lieberman, Ph.D, Westwood, MA, USA and Prof. Lawrence E. Armstrong, University of Connecticut, Human Performance Laboratory, Storrs, CT, USA

Introduction

It is well known that ensuring an adequate level of hydration plays an important role in overall health, including maintaining brain function. Scientific research on dehydration induced by high heat and exercise has shown that mental function (cognition) is greatly affected by severe dehydration.

Recently two large, carefully designed studies were conducted at the University of Connecticut, USA, to examine the effects of mild dehydration on cognitive function in healthy individuals. To measure mental function, tests of cognitive performance, mood and symptoms of dehydration were used by the scientists. One study was conducted with 26 men and another with 25 women. Both studies examined the effects of mild dehydration on cognitive function using identical procedures. Men and women all took part in two mildly dehydrated conditions and a fully hydrated condition which could be directly compared using standard statistical procedures. To assess the level of dehydration, body weight was measured using special, high accuracy scales. Men on average were 1.59% dehydrated, women were 1.36% dehydrated. Most adults reach this level of dehydration one or more times during the course of a week.

Key Findings

The results showed that, in both men and women, mild dehydration had an adverse effect on mood as well as ability to concentrate. When mildly dehydrated, both men and women were more likely to feel fatigued and to have diminished cognitive performance, specifically vigilance. Men were more likely to experience short-term memory degradation when mildly dehydrated, but overall, women were more sensitive to dehydration than men. For example, women were more likely to report a headache, fatigue, confusion and lack of energy. Women also felt moderate exercise was more difficult when dehydrated.

Relevance for healthy hydration

These studies provide a better understanding of the effects of mild dehydration on cognitive function of men and women and have many practical applications. They demonstrate the importance of maintaining optimal levels of hydration during normal daily activities and during moderate exercise. Both men and women will perform better and feel better if they maintain full hydration by regularly consuming water. In addition, vulnerable populations such as elderly people and children may be more susceptible to the adverse effects of dehydration on mood and cognitive performance.

>>Ganio, M.S., Armstrong, L.E., Casa, D.J., McDermott, B.P., Lee, E.C., Yamamoto, L.M., Marzano, S., Lopez, R.M., Jimenez, L., Le Bellego, L., Chevillotte, E., and Lieberman, H.R. (2011) Mild dehydration impairs cognitive performance and mood of men. *British Journal of Nutrition* 106(10),1535-1543, 2011.

>>Armstrong, L.E., Ganio, M.S., Casa, D.J., Lee, E.C., McDermott, B.P., Klau, J.F., Jimenez, L., Le Bellego, L., Chevillotte, E., Lieberman, H.R. Mild dehydration affects mood in healthy young women. *Journal of Nutrition*, vol. 142 no. 2, 382-388, February 1, 2012.