EDITORIAL
Dr. Andrea Poli

The European Hydration Institute celebrates the first anniversary of its inception in autumn 2011 and much has been achieved in a very short time.

The Institute was founded in response to feedback from stakeholders, including health care professionals, scientists and journalists who noted that this important aspect of health was often overlooked. They indicated that they would welcome the creation of a science based, one-stop shop that focused solely on hydration to ensure that existing knowledge is collated, to steer further advancements in the science and to disseminate evidence-based information.

Over the past twelve months, the EHI, working closely with its Science Advisory Board, trustees and partners has continued to develop the EHI website which now attracts thousands of visitors each month. The dynamic site contains facts and information on hydration and a wealth of resources and links, including a library of more than 700 hydration-related scientific abstracts. Throughout the year a series of educational materials for dissemination by healthcare professionals has been created and these are proving popular with site users.

The EHI has funded two scientific reviews which will shortly be submitted for publication, one on hydration measurement and definition and another on the impact of hydration on cognitive decline in older people. It launched its first call for applications for student grants awards in October 2010 and has supported seven graduate student projects across three countries. A study to assess the impact of hydration status on the outcome of older patients admitted to hospital as medical emergencies is in the final stages of development and further work to measure the hydration status of individuals in different EU countries will commence shortly.

The EHI has started to establish a network of individuals with a strong interest in hydration. A number of these came together at the EHI’s first Hydration Network Meeting at the Royal Society of Medicine in London in June at which a wide array of thought-provoking lectures and discussions took place. The EHI has also been active at a number of scientific conferences, both at national level and Pan-EU level, where it has been successful in including hydration on the scientific agenda.

Clearly, this is just a start and there is much more to do, but the Institute is now firmly established and is increasingly attracting the interest of others who are keen to work in partnership to raise the profile of hydration as an aspect of public health. As a trustee and a representative of one of the EHI’s founding partners – the Nutrition Foundation of Italy - I am proud to be associated with this exciting initiative and urge others to get involved.

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Diet, as well as other lifestyle choices, has the potential to modify our brain function. The identification of nutrients that maintain or improve mental performance has been in the forefront of modern research. New information has been generated to boost the development of diet plans or food products aimed at enhancing mental fitness.

Many nutrients may directly or indirectly affect brain function by interfering with brain structure or with processes occurring in the brain. For example, dietary intake of energy, particularly of carbohydrates satisfies the energy requirements of the brain. Amino acids, particularly tyrosine and tryptophan, are precursors of brain neurotransmitters, and n-3 and n-6 fatty acids play many vital roles.

Micronutrients, such as vitamins (A, D, E, K, B1, B2, B3, B6, B12, ascorbic acid and folic acid) and minerals (iron, zinc, copper, selenium, manganese and iodine) play important roles in key enzymatic processes involving the metabolism of neurotransmitters, structural and functional brain lipids and proteins, DNA and RNA, as well as energy metabolism.

Dietary non-nutrients may also affect brain function. Caffeine may attenuate decrements in mental performance due to fatigue or aging acting through adenosine receptor antagonism. Antioxidants, particularly phenols, may protect against oxidative degeneration of brain related to normal or pathological aging. Water is a component of brain cell structure and may affect brain function.

Despite information on the molecular basis of the effect of nutrients on brain function, evidence on the benefits of diets rich in these nutrients on mental performance of population groups is scarce, mainly because of methodological difficulties. Consequently, health claims on mental performance of food products that contain nutrients and non-nutrients linked with cognitive function, are difficult to substantiate. Therefore the European Food Safety Authority Panel on Dietetic Products, Nutrition and Allergies has denied a positive scientific opinion in most submitted claims. Water is amongst the few on which the Panel has expressed a positive scientific opinion on a cause and effect relationship between intake and maintenance of normal cognitive function. This emphasizes the importance of euhydration in health and well-being.
Acute stress has been linked to changes in cognitive performance and mood, and these have in some way been associated to an increased release of cortisol due to stress. Both glucose and caffeine consumed in isolation have been shown to regulate cortisol response and affect cognitive performance and affect mood. Nonetheless, there has been very little research regarding their behavioural and physiological effects when taken together. The aim of this review was to assess the effect of the two substances in combination under stressful and physically demanding conditions (such as fire-fighting training) on cognition, mood and cortisol release and to investigate the neural basis of these effects.

Sünram-Lea et al [1] using a double-blind design, administered a 330-ml drink to 81 participants. Drinks contained either (a) 50 g glucose and 40 mg caffeine, (b) 10.25 g of fructose/ glucose and 80 mg caffeine or a placebo drink, and were tested across a range of cognitive tasks, mood and physiological measures. The results demonstrated an increase in grip strength and improved memory performance after consuming the drink containing 50 g glucose and 40 mg caffeine, and both active drinks resulted in improved outcomes on the information processing task compared to the placebo. In regards to the effect on mood, the drink containing 50 g glucose and 40 mg caffeine reduced anxiety levels and significantly decreased self-reported levels of stress following the fire-fighter training. Serra-Grabulosa et al [2] previously evaluated the effects of caffeine and glucose on sustained attention, using functional magnetic resonance imaging (fMRI) in a double-blind, randomized trial with 40 young right-handed healthy, low caffeine-consuming subjects. Participants who received combined caffeine and glucose showed similar performance to the others but had enhanced activation in the bilateral parietal and left prefrontal cortex, both areas being related to processes affecting sustained attention and working memory.

Based on the results of both studies, in situations where stress is combined with physical performance, consumption of a drink containing glucose and caffeine may provide an easy to implement and cost effective option for maintaining mental performance levels, especially sustained attention and working memory processes, as well as ameliorating the negative effects of stress on mood.

References:

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WHAT'S NEW?

EHI 1ST HYDRATION NETWORKING MEETING: A SUCCESSFUL INITIATIVE

On 9th June 2011 the EHI held its first “Hydration networking meeting” at the Royal Society of Medicine in London. This initiative was created with the aim of encouraging networking and discussion among those from across Europe with particular interests in human hydration, health and performance. It offered a unique opportunity to foster discussion about hydration and to share latest opinions.

Thirty-three invited participants attended the event from Universities, Institutes and organisations from seven European countries including the experts from the EHI’s Science Advisory Board. Presentations covered a wide range of topics, and included some of the latest research in this field. Recipients of the 2011 EHI student grants awards had the opportunity to outline their research approach.

The EHI received excellent feedback from those attending the meeting and all have indicated a desire to attend future network sessions and become part of the wider EHI network.

To view the agenda and access the presentations, please visit the EHI’s website: www.europeanhydrationinstitute.org/past_events.html

THE EHI WEBSITE, NOW IN SPANISH

The EHI is pleased to announce the launch of a Spanish version of its website in September 2011.

This new site has been created in response to stakeholders who told us that they really valued the information provided by the EHI, but thought it would be even more accessible and useful if translated into other languages, particularly Spanish. With this new site the EHI reinforces its objective of sharing knowledge and understanding of all matters relating to human hydration and the effects of health, wellness and performance.

Access the Spanish version of the EHI website via the EHI homepage: www.europeanhydrationinstitute.org

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