Hydration for Health Conference Emphasizes Vasopressin and Kidney Diseases

The Hydration for Health Scientific Conference remains unique as the world's only annual gathering that focuses solely on the health benefits of water consumption and creates dialogues among clinicians, scientists, physiologists, dieticians, and global healthcare organizations. The July 4–5, 2017 program included speakers from Australia, Canada, France, Italy, Sweden, the United Kingdom, and the United States. Their presentations considered (a) the positive influences of water consumption on kidney diseases and urinary tract infection (UTI), (b) human neuroendocrine regulation of water and electrolytes, and (c) low daily water consumption as an epidemiologic risk factor for chronic diseases. Three speakers focused on the essential roles of vasopressin (i.e., the antidiuretic hormone) and its surrogate (copeptin) in the sensation of thirst and as a biomarker of renal diseases.

The initial article in this *Annals of Nutrition and Metabolism* supplement (pages 3–7) focused on the varied roles that arginine vasopressin (AVP) plays in the brain and peripheral organs. Daniel Bichet, PhD, University of Montreal, Canada described an essential component of body water balance in his article, “Vasopressin and the regulation of thirst.” His topic expanded a previous publication in this journal [1]. Professor Bichet began by explaining 2 ways in which the brain perceives dehydration: increased blood concentration and decreased pressure

within blood vessels. He then described a rapid response to dehydration that is perceived by the brain, before blood concentration and pressure change; this response involves anticipatory signals initiated by sensory neurons in the mouth and throat. Through this dual-pathway redundancy, the brain regulates total body water by ensuring that the feeling of thirst is sensed when dehydration occurs.

Six articles in this journal supplement focus on disorders and diseases of the kidneys. On pages 8–10, members of Danone Nutricia Research, led by Mariacristina Vecchio, PharmD, describe the available literature regarding the effects of increased water consumption on the incidence and treatment of urinary tract infection (UTI). The authors concluded that sound information about prevention of cystitis is lacking, and emphasized the need for a well-designed randomized controlled trial to assess the effects of increased water intake on cystitis.

Acute kidney injury (AKI) is often encountered after major surgery or organ damage. It is associated with uncontrolled inflammation and is diagnosed only after significant renal damage has occurred. Researchers Sylvie Breton, PhD and Dennis Brown, PhD, both members of the faculty at Harvard Medical School, USA recently discovered a novel biomarker that detects AKI within a few hours of onset. Reducing the time of diagnosis and recog-

nizing the specific renal cells involved may lead to the development of a new therapy for AKI.

Two conference presentations (pages 21–27) specifically focused on chronic kidney disease (CKD) research. First, Swedish investigator Sofia Enhörning, MD, PhD (winner of the 2016 Hydration for Kidney Health Research Initiative grant, a collaborative effort of Danone Nutricia Research and the International Society of Nephrology) described the role of AVP in type 2 diabetes, CKD, and associated cardiovascular complications. Once type 2 diabetes is established, the risk of cardio-renal disease greatly increases, concurrent with plasma AVP and copeptin levels. Thus, copeptin may someday be used to identify individuals [2] who are at higher risk of diabetes and renal disease (e.g., CKD and other kidney disorders), and offer early preventive strategies. For example, the simple act of increasing water intake may provide beneficial glucometabolic effects for CKD patients, and patients with other renal diseases, who habitually consume a low volume. Second, Ray El Boustany, PharmD, PhD, from Inserm, France reported her research regarding diabetic nephropathy, the most common form of CKD. The relationship between type 1 or type 2 diabetes and AVP is widely recognized, yet the causes of elevated plasma AVP are still unknown. Both experimental animal research and epidemiological studies provide strong arguments regarding the detrimental effects of high circulating AVP and copeptin levels. This article ends with a call for randomized controlled intervention studies involving diabetic humans with early kidney disease and high copeptin levels, to evaluate the efficacy of increased daily water intake.

Global initiatives to counter the growing incidence of CKD are described by Adeera Levin, MD. As President of the International Society of Nephrology and Head of the Division of Nephrology, University of British Columbia, Canada, she is well qualified to describe the worldwide state of renal health care. Dr. Levin presented the results of one major ISN project: the Global Kidney

Health Atlas. This atlas is the first multinational, cross-sectional survey that describes and evaluates current kidney care capacities worldwide. She explained the major clinical obstacles that CKD patients face globally, including the various differences that exist in the access to prevention, treatment, kidney dialysis, transplantation, and trained health care professionals. These obstacles are especially important because diabetes and hypertension, which are growing concurrently with the worldwide increase of obesity, are major risk factors for CKD. The current innovative approaches of the International Society of Nephrology (see pages 28–32) include collaborative clinical trials, research grants, patient-oriented research consortia, and international surveys of health care.

Since 2012, the research effort of new investigators in the field of hydration and health have been acknowledged via the Young Researcher Award. For the first time in the history of this conference, 6 new investigators shared their hydration research findings, in rapid order during brief 3-min summary presentations to the audience of 200 professionals. Abstracts of their work appear on pages 39–44. Connor F. Underwood of Sydney, Australia was selected as the winner of this competition and received the 2017 Young Researcher Award trophy from the Hydration for Health Expert Working Group. A manuscript describing his research, utilizing an animal model of polycystic kidney disease, appears on pages 33–38. Interestingly, increased fluid intake has been identified as one means of reducing the formation of renal cysts.

The aforementioned articles foreshadow the upcoming 10th Hydration for Health Scientific Conference, which will be held in Évian-les-Bains, France on June 26–27, 2018. That event will celebrate a decade of multinational hydration exploration, the scientific relevance of optimal water intake as part of a healthy lifestyle, and its importance for global public health.

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References

- 1 Bichet DG: Vasopressin at central levels and consequences of dehydration. *Ann Nutr Metab* 2016;68(suppl 2):19–23.
- 2 Enhörning S, Christensson A, Melander O: Plasma copeptin as a predictor of kidney disease. *Nephrol Dial Transplant* 2018, DOI: 10.1093/ndt/gfy017.