Water as an essential nutriment: The physiological basis of hydration

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RESPONSE TO LETTER TO THE EDITOR

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In his letter, Dr Arnaud (Arnaud and Noakes, 2011) mentions that their study (Szinnai *et al*., 2005), carried out in healthy young volunteers, showed that an acute dehydration up to a level of 2.6% of body weight did not affect their cognitive-motor function. On the contrary, other authors (Ritz and Berrut, 2005; Shirreffs, 2005) showed that a mild dehydration can lead to a significant impairment in both cognitive function and physical performance. Furthermore, experimental acute dehydration in healthy volunteers, such as reported by Szinnai *et al*., may not be a valid model for severe chronic dehydration in elderly subjects. Therefore, the concept that 'severe dehydration affects the function of many systems and is a life-threatening condition' is supported by many studies.

Dr Arnaud claims that elderly subjects are prone to the development of hyponatremia and emphasizes the risks of over-hydration leading to water intoxication. Although this condition may occur, the increased mortality rate in the French elderly population during the heat wave of summer 2003 was mainly due to hypertonic dehydration.

Another concern of Dr Arnaud is the risk of excessive intake of water or hypotonic fluids during exercise leading to exercise-induced hyponatremia with a risk of cerebral edema. It is true that abnormal water intake has been reported in a few endurance athletes, but it is unlikely that this rare condition occurs in those following the international recommendations for water requirements.

Finally, Dr Arnaud claims that we limit the recommendations to water and not to other fluids, including milk, tea, coffee and fruit juices. This is obviously not correct, as we mentioned, 'the water we drink is essentially composed of water and other liquids with a high water content'.

In conclusion, Dr Arnaud is much concerned about the rare risks of excessive water intake, whereas the recent and previous expert consultations on human water requirements insist on an important public health issue, which is the prevention of hypertonic dehydration due to insufficient water intake, particularly in the elderly population. Our article reflects this public health concern.

Conflict of interest

The authors declare no conflict of interest.

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