Natremia after fasting 12 h, kidney disease and aging

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Dmitrieva et al. report that middle-age high-normal natremia after 12-h fasting is a risk factor for accelerated biological aging and premature mortality.[1] The manuscript was widely publicized in the lay press and, like others,[2] interpreted as supporting a need for the general population to increase water intake ("The results suggest that proper hydration may slow down aging and prolong a disease-free life", "Researchers Find Super Simple Key to Healthy Aging:Good Hydration!").[3] However, excessive water intake may be lethal.[4] A recent Science manuscript has emphasized the obvious:fluid needs are multifactorial, food (e.g., fruits) may contribute to fluid ingestion.[5] Given the high prevalence of high fasting natremia, a likely explanation is that participants complied with what they believed were the fasting instructions and refrained from eating or drinking fluid before blood sampling, as opposed to them having a thirst defect.[1] In the absence of overnight water ingestion, the key determinant of morning natremia is the urine concentration capacity of the kidneys. A urine concentration defect (i.e., partial nephrogenic diabetes insipidus) is an early feature of chronic kidney disease (CKD). Interestingly, 6 of the 15 biomarkers of biological aging used (i.e., GFR, creatinine, urea, uric acid, cystatin-C, β-2-microglobulin) directly reflect kidney function, while others (e.g., SBP, CRP) are indirectly related to kidney function. Thus, the data are consistent with high fasting natremia reflecting kidney dysfunction, a known risk factor for biological aging and premature mortality. Outcomes may thus not improve by drinking more fluid, but by early detection and treatment of CKD.

Declaration of interests

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References

1 Dmitrieva NI, Gagarin A, Liu D, Wu CO, Boehm M. Middle-age high normal serum sodium as a risk factor for accelerated biological aging, chronic diseases, and premature mortality. *eBioMedicine*. 2023;87:104404.
2 Dmitrieva NI, Liu D, Wu CO, Boehm M. Middle age serum sodium levels in the upper part of normal range and risk of heart failure. *Eur Heart J*. 2022;43(35):3335–3348.
3 https://scitechdaily.com/researchers-find-super-simple-key-to-healthy-aging-good-hydration/. Accessed January 29, 2023.
4 Adrogué HJ, Tucker BM, Madias NE. Diagnosis and management of hyponatremia: a review. *JAMA*. 2022;328(3):280–291.
5 Yamada Y, Zhang X, Henderson MET, et al. Variation in human water turnover associated with environmental and lifestyle factors. *Science*. 2022;378(6622):909–915.

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