

The effects of 6-month hydrogen-rich water intake on molecular and phenotypic biomarkers of aging in older adults aged 70 years and over: A randomized controlled pilot trial

Study Design

- A randomized controlled pilot trial with 40 older adults (20 women), average age 76 years, investigating the effects of 6 months of hydrogen-rich water (HRW) intake on biomarkers of aging.
- **Participants** were randomly assigned to drink either 0.5 litres per day of HRW (at 15 ppm of hydrogen) or a control drink (0 ppm) for the full 6-month period.

Telomere Length (a key marker of cellular aging)

- **A significant difference was found for telomere length** – telomeres actually lengthened in the HRW group (from 0.99 to 1.02) while they shortened in the control group (from 0.92 to 0.79). Telomere shortening is one of the primary hallmarks of aging.

DNA Methylation (epigenetic aging)

- A marker of DNA methylation (TET2 enzyme expression) increased in both groups after 6 months, but the increase was significantly greater in the HRW group compared to the control group.
- There was also a strong trend toward increased overall DNA methylation in the HRW group, while it decreased in the control group, though this did not reach full statistical significance.

Brain Metabolism

- HRW was superior to control water in increasing brain choline and NAA (N-acetylaspartate) levels in the left frontal grey matter, brain creatine in the right parietal white matter, and brain NAA in the right parietal mesial grey matter – all markers associated with healthy brain function and neuronal integrity.

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Physical Function

- Chair stand performance – a standard test of lower body strength and functional mobility – improved significantly more in the HRW group than in the control group.

No Significant Differences Found For

- No significant differences between groups were found for other outcomes including cognitive functioning, body composition, resting blood pressure, facial skin features, sleep outcomes, and health-related quality of life.

Conclusion

- The authors concluded that, owing to hydrogen's wide-ranging mechanisms of action, HRW could be recognized as a possible anti-aging agent that addresses several hallmarks of aging, including loss of physical function and telomere shortening.

Important Caveats: This was explicitly a small pilot trial with only 40 participants, designed to test feasibility and generate hypotheses rather than provide definitive answers. The dose was also relatively modest (0.5L/day at 15 ppm). Larger, adequately powered trials are needed before firm conclusions can be drawn.



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