

News Release

Title

Elevated arsenic level in fasting serum via ingestion of fish meat increased the risk of hypertension in humans and mice.

Key Points

- Dose-response relationship between fasting serum arsenic level and the prevalence of hypertension was found.
- Positive association between fish meat intake and the prevalence of hypertension was mediated by the increase in arsenic level in serum.
- Since fish meat also contains various healthy components including vitamins and omega-3 fatty acids, the health effect of fish meat should be carefully considered.

Summary

There has been a shortage of human studies to elucidate the association between serum arsenic levels and the prevalence of hypertension. This study multidirectionally investigated associations among arsenic exposure, dietary ingestion, and the risk of hypertension by combined human epidemiological and mouse experimental studies.

This study focused on the total arsenic level in fasting serum, a biomarker of arsenic exposure. Associations among ingestion frequencies of 54 diet items of Japanese food separated into six categories, total arsenic level in fasting serum, and the prevalence of hypertension were investigated in 2,709 general people in Japan. Logistic regression analysis demonstrated a dose-dependent association between serum arsenic level and hypertension and a positive association between the ingestion of fish meat and hypertension. Further analysis showed that the latter association was fully mediated by increased fasting serum arsenic levels in humans. Similarly, oral exposure to the putative human-equivalent dose of arsenic species mixture with the same ratios in a common fish meat in Japan increased systolic blood pressure and arsenic levels in fasting serum in mice.

This interdisciplinary approach suggests that fish-meat ingestion is a potential risk factor of arsenic-mediated hypertension. Because the increased consumption of fish meat is a recent global trend, health risks of the increased ingestion of arsenic via fish meat should be further investigated.

Publication

Journal: European Heart Journal Open

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DOI: 10.1093/ehjopen/oead074

Japanese ver.

https://www.med.nagoya-u.ac.jp/medicalJ/research/pdf/Eur_230904.pdf