Prenatal PFAS association with obstetric outcomes in the Japan Environment and Children's Study-JECS

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Per- and polyfluoroalkyl substances (PFAS) have been linked to adverse obstetric outcomes like preterm labor and gestational diabetes. Here we aim to evaluate the association between prenatal exposure to PFAS and birth outcomes in the nationwide birth cohort called Japan Environment and Children's Study (JECS).This study includes 23,596 JECS participants whose first-trimester serum samples in principle had measurements of PFAS concentration by liquid chromatography tandem mass spectrometry. Outcome data was obtained from doctor's questionnaire at birth. Covariates were obtained from maternal or doctor's prenatal questionnaires. We obtained the adjusted odds ratio (aOR) and 95% confidence intervals (CI) between quartiles (Q) of exposure to individual PFAS and obstetric outcomes by binary logistic regression. The Benjamini-Hochberg method was used to control false discovery rate.Here we present the associations between 7 PFAS with detection rate >95% and cesarean delivery (CD), threatened abortion (TA), and threatened preterm labor (TPL). Q4 of PFOA (aOR 1.19 [95%CI 1.07, 1.31]) and Q4 of PFNA (1.15 [1.04, 1.27]) were associated with higher risk of CD; while PFOA Q3 (1.22 [1.09, 1.37]) and Q4 (1.25 [1.11, 1.41]), PFDA Q3 (1.16 [1.04, 1.30]) and Q4 (1.17 [1.04, 1.31]), PFNA Q3 (1.17[1.04,1.31]), and PFOS Q3 (1.17 [1.05, 1.32] were associated with an higher risk of TA. Q4 of PFHxS decreased the risk of TPL (0.73 [0.67, 0.80]), and Q2 of PFOS had an increased aOR for this outcome (1.14[1.04,1.25]).Exposure to PFAS during pregnancy has modest but significant positive associations with adverse birth outcomes. We also found one negative association between PFHxS and TPL. The use of many PFAS has been restricted, but they may still have an impact on obstetric health. This work was supported by the Ministry of the Environment, Japan. The funder had no role in the present study design, data collection, data analysis, data interpretation, or writing of the report.

Clustering of Partial Tooth Loss Patterns and Association with Cardiovascular Health in Japan

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Background : Cardiovascular health (CVH), defined by the American Heart Association, is a composite index that helps prevent cardiovascular disease (CVD) by addressing behavioral and biological risk factors. Although tooth loss has been linked to higher CVD risk, the impact of specific patterns of tooth loss on CVH remains unclear. We aimed to identify clinically relevant partial tooth loss patterns and examine their association with CVH in a large Japanese population.

Methods : We conducted a retrospective cohort study using JMDC health insurance claims data from 2016 to 2019 in Japan. The study included 215,750 adults aged 40–75 with at least 20 remaining teeth who had both dental and general health checkups. CVH scores were based on seven metrics: four behavioral (smoking, body mass index [BMI], physical activity, and diet) and three biological (blood pressure, fasting glucose, and total cholesterol). We used K-median clustering to classify partial tooth loss patterns and assessed their associations with CVH scores using fixed-effects regression models, including sex-stratified analyses.

Results : The mean age was 49.7 ± 7.2 years, and 55.8% were men. Six patterns of partial tooth loss were identified: maxillary molar loss, mandibular molar loss, unilateral molar loss, and minor anterior loss. Individuals with any tooth loss had lower CVH scores than those with all 28 teeth without any missing teeth (mean CVH score: 4.5 ± 1.3). Maxillary molar loss showed the greatest score reduction (β = -0.28; 95% CI: -0.34 to -0.22), especially in men. Among CVH components, behavioral factors, particularly BMI and diet, were more strongly linked to tooth loss than biological factors.

Conclusion : Partial tooth loss, especially of molars, is linked to poorer CVH, mainly through modifiable lifestyle factors. These findings underscore the need for integrated dental and cardiovascular prevention, with an emphasis on preserving molar occlusion.

A Review of Sleep-related Indicators Measured in Large Population-based Cohort Studies in Japan

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Background : Sleep measurement methods have been a primary focus in sleep epidemiological research. This study reviewed sleep-related indicators measured in large population-based cohort studies in Japan.

Methods : PubMed, Ichushi-Web, and official cohort study websites were systematically reviewed from January 1, 2004, to March 31, 2025, to identify studies that measured sleep-related indicators as exposures or outcomes in 19 large population-based cohorts, 15 of which were included in the Japan Epidemiological Association registry. Data on sleep measurement methods and main study results were extracted.

Results : Of 102 studies in 12 cohorts, 75 (74%) examined subjective sleep quantity or quality based on questionnaires, and 27 (26%) used objective measures of sleep. Among subjective measures, sleep duration was frequently self-reported (57 studies in 10 cohorts), while sleep quality was asked directly (e.g., “Do you think you get enough sleep?”) or indirectly as part of sleep-related scores such as the Pittsburgh Sleep Quality Index (51 studies in 10 cohorts). Regarding objective measures, the Circulatory Risk in Communities Study cohort measured 3% oxygen desaturation index by pulse oximetry (9 studies) and respiratory disturbance index by airflow monitor (1 study), the Japan Multi-Institutional Collaborative Cohort Study used actigraphy (1 study), the Nagahama cohort used pulse oximetry (12 studies) and actigraphy (13 studies), and the Tohoku Medical Megabank Project used actigraphy (1 study) and contactless biomotion sleep sensors (2 studies).

Conclusion : Population-based cohort studies in Japan have predominantly relied on subjective measures of sleep, although the use of objective sleep measures has been increasing in recent years.

Dietary Acid Load and Risk of Cerebrovascular Disease: Findings from the J-MICC Study

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Background : Cerebrovascular disease remains a major public health problem and is a leading cause of death and disability in many countries. Dietary acid load (DAL) is a concept used to evaluate the disorder of the acid–base balance caused by diet. DAL has been reported to be associated with multiple cardiometabolic risk factors, including hypertension, insulin resistance, type 2 diabetes, obesity, and dyslipidemia, as well as cardiovascular disease mortality. However, evidence on the association between DAL and the risk of cerebrovascular disease remains limited. This study aimed to investigate the relationship between DAL and the risk of cerebrovascular disease in a Japanese population.

Methods : The analyses were conducted on 25,343 participants aged 35 to 69 years at baseline in the Japan Multi-Institutional Collaborative Cohort Study. This study evaluated DAL using NEAP, calculated as: "NEAP = 54.5 × protein (g/day) / potassium (mEq/day) – 10.2". Potassium and protein intake were estimated from the Food Frequency Questionnaire (FFQ). Information on cerebrovascular disease incidence was obtained from follow-up surveys of participants and hospitals.Using Cox proportional hazards models adjusted for age, sex, and other potential confounders, we estimated adjusted hazard ratios (HRs) and 95% confidence intervals (CIs) for cerebrovascular disease incidence, with the lowest quartile of the NEAP score as the reference category. Analyses by type of cerebrovascular disease (hemorrhagic stroke, ischemic stroke) were also performed.

Results : During a median follow-up of 15.2 years, 418 cerebrovascular disease incidences were observed. No significant association was observed between DAL and increased risk of cerebrovascular disease (HR 1.21, 95% CI 0.90, 1.57). Moreover, DAL was associated with higher risk of hemorrhagic stroke but not ischemic stroke.

Conclusion : The present study suggests that DAL may be associated with the risk of hemorrhagic stroke in Japanese adults.

Associations between adherence to Japanese Food Guide and nutrient density, climate impact, and cost

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Backgrounds : To achieve sustainable and healthy diets, it is necessary to develop food-based dietary guidelines (FBDG) that incorporate environmental sustainability, including climate impact and affordability. However, it remains unclear whether adherence to the current FBDG in Japan (Japanese Food Guide Spinning Top [JFGST]) leads to more sustainable diets. This study examined associations between adherence to the JFGST, considering food choices, specifically animal protein consumption pattern, and nutrient density, climate impact, and monetary costs.

Methods : The study used data from the 2017 Saitama Prefecture Nutrition Survey. A total of 479 participants (206 men and 273 women), aged 30–65 years from Saitama Prefecture, Japan, were analyzed. They were selected based on their completion of a self-administered questionnaire and a two-day dietary record showing plausible energy intake. Adherence to the JFGST (original and modified scores incorporating white-to-red meat ratio), Nutrient-Rich Food index (NRF) 9.3, greenhouse gas emissions (GHGE), and monetary costs were calculated from the dietary records. Multiple linear regressions were performed to examine the relationships between the JFGST scores, NRF9.3, GHGE, and monetary costs.

Results : Higher JFGST scores were associated with higher NRF9.3. No score showed a significant association with GHGE or monetary cost in men. In women, both scores were associated with higher GHGE and monetary costs; the association with GHGE was weaker with the modified score. After adjusting for energy intake, these significant associations disappeared.

Conclusions : Nutrient density increased with higher JFGST compliance in both sexes; however, GHGE showed a positive association only in women. The impact of considering animal protein consumption pattern on GHGE and monetary costs is limited. Further examination of specific food choices is necessary to improve the Japanese Food Guide and consider cost and climate impact.