Association of NT-proBNP with Alzheimer's Disease Biomarkers and Cognitive Function

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Objective : Heart failure (HF) and cognitive decline are crucial health issues in a superaged society, and their significant association has been reported. This study aimed to investigate the association between HF and Alzheimer's disease (AD) biomarkers in community-dwelling older adults.

Methods : This cross-sectional study, a part of the Japan Dementia Early Phase Project, recruited 524 community-dwelling older adults (mean age: 71.2 ± 6.5 years; 62.6% women) without long-term care insurance certification needs from the Tohoku Medical Megabank Brain MRI Survey. We measured the sign of HF by serum NP-proBNP, with values ≥ 125pg/mL defined as elevated. AD biomarkers included Amyloid-beta(Aβ)42/ Aβ40, p-tau217, Neurofilament Light Chain, and glial fibrillary acidic protein. Each biomarker was analyzed as both continuous variables and binary variables, divided by the cut-off values related to cognitive decline. Cognitive function was measured using the Mini-Mental State Examination, with values < 24 defined as cognitive decline. We used linear and modified Poisson regression models to examine the associations of NT-proBNP with AD biomarkers and cognitive decline.

Results : We found that 22.9% of participants had elevated NT-proBNP. Participants with elevated NT-proBNP were older and showed lower cognitive function than those with normal NT-proBNP. Multivariable adjusted models revealed that participants with elevated NT-proBNP had higher values of p-tau217 (difference: 0.073, 95% confidence interval [CI]: 0.022, 0.124) and higher prevalence of elevated p-tau217 (prevalence ratio: 1.89, 95%CI: 1.94, 3.44). No apparent associations were observed with other AD biomarkers and cognitive decline.

Conclusion : Elevated NT-proBNP was associated with higher serum p-tau217 concentrations, suggesting a potential association of cardiac dysfunction and neurodegeneration among community-dwelling older adults.

Severe periodontitis and its associated factors among Japanese residents in Southeast Asia

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Background : Periodontal diseases are prevalent among adults. Japanese residents in Southeast Asia may have a higher risk of periodontal diseases due to lifestyles changes and difficulty in accessing dental services.

Objectives : This cross-sectional study aimed to investigate severe periodontitis and its associated factors among Japanese residents in Southeast Asia.

Methods : Data were collected from 314 Japanese residents in Cambodia and Vietnam (males, 176; females, 138; mean age, 46.5 ± 11.2 years) using an online self-reported questionnaire including items on sociodemographic factors, lifestyles, language skills, oral health behavior, psychological distress, nutritional status, and severe periodontal diseases. The outcome variable was severe periodontal diseases, which was assessed using validated screening questions. Responses of more than two "yes" out of four questions, including 1) assumption of periodontal diseases, 2) tooth mobility, 3) alveolar bone loss, and 4) gum bleeding, were indicative of severe periodontitis.

Results : The prevalence of severe periodontitis was 21.0%. Sex, age, living alone, smoking, alcohol intake, tooth-brushing before bedtime and psychological distress were significantly associated with severe periodontitis. A logistic regression analysis revealed that individuals who were older (odds ratio [OR], 1.06; 95% confidential interval [CI], 1.02–1.09; $P < 0.001$), and had poor English skills (OR, 2.62; 95% CI, 1.16–5.88; $P = 0.02$), current smoking habits (OR, 3.89; 95% CI, 1.71–8.81; $P = 0.001$), frequent alcohol intake (OR, 3.03; 95% CI, 1.22–7.56; $P = 0.017$), and psychological distress (OR, 3.58; 95% CI, 1.69–7.54; $P = 0.001$) were significantly more likely to have severe periodontitis than those without these conditions.

Conclusion : The findings indicate that age, poor English skills, current smoking, frequent alcohol intake and psychological distress were associated with severe periodontitis in this population.

Psychometric Properties of the Areas of Worklife Survey in a Thai Industrial Sector

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Introduction : The Areas of Worklife Survey (AWS) is used to assess organizational factors that may contribute to subsequent burnout. However, evidence regarding its construct and criterion validity has been reported, predominantly in human service settings. This study aimed to evaluate the construct validity of the AWS measurement model and the criterion validity of the AWS–burnout relationship among industrial workers in Thailand.

Methods : In this cross-sectional study, 390 participants completed the AWS and the Maslach Burnout Inventory–General Survey (MBI–GS). Data were analyzed using confirmatory factor analysis within a structural equation modelling framework.

Results : A modified six-factor AWS model—excluding five items and permitting two correlated error terms—demonstrated satisfactory fit ($\chi^2(213) = 436.02$, $P<.001$; $\chi^2/df = 2.05$; CFI = 0.94; TLI = 0.92; RMSEA = 0.053; SRMR = 0.053). Convergent validity (CR = 0.74–0.87; AVE = 0.49–0.58) and discriminant validity were acceptable for most dimensions; however, the Fairness dimension (AVE = 0.36) and the Reward–Fairness correlation remained problematic. The partial mediation model exhibited acceptable criterion validity, with all mediation paths—apart from reward to values—being statistically significant.

Conclusion : The AWS appears a viable tool for assessing work environment factors linked to burnout in industrial contexts. Nonetheless, further refinements are necessary to ensure robust dimension specific validity with minimal modification.

Associations of adolescent and recent exercise with physical function in middle-age and older adults

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Background : The maintenance of physical function is one of the important factors to extend healthy life expectancy. However, evidence of exercise during adolescence on physical function in middle and older adulthood is limited.

Objective : This study aimed to examine the associations between exercise time during adolescence or exercise time in the past 10 years, and physical function in middle-age and older adults.Methods: A cross-sectional survey was conducted among 3,887 community-dwelling adults (2,495 women) without missing values. Total exercise time (TET) at ages 15, 20, and 25, as well as TET over the past 10 years, was calculated from self-reported exercise histories (hours/weeks x 52 weeks/years x years). Height, weight, lower limb muscle strength, and grip strength were measured. Multivariable linear regression models stratified by sex were used to assess associations between TET at each time point and both lower limb and grip strength, adjusting for age and body mass index.

Results : The mean measurements for men and women were 58.4 and 56.8 years for age, 27.7 kg and 18.9 kg for lower limb muscle strength, and 46.2 kg and 30.1 kg for grip strength. In men, lower limb muscle strength was significantly associated only with TET in the past 10 years ($\beta = 0.33$), whereas grip strength was significantly associated with TET at ages 20, 25, and in the past 10 years ($\beta = 0.16$, $\beta = 0.18$, $\beta = 0.23$). In women, lower limb muscle strength was significantly associated with all TETs (15: $\beta = 0.11$, 20: $\beta = 0.13$, 25: $\beta = 0.14$, past 10 years: $\beta = 0.17$), and grip strength showed similar associations with all TETs ($\beta = 0.14$, $\beta = 0.18$, $\beta = 0.18$, $\beta = 0.16$). All obtained p-values were less than 0.01.

Conclusion : The influence of past exercise experience on subsequent lower limb and grip strength differed by sex. Promoting the importance of exercise from an early age may directly contribute to the enhancement of future physical function, ultimately extending healthy life expectancy.

Effect of the COVID-19 pandemic on death due to adult T-cell leukemia-lymphoma in Japan

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Background : While the effect of the COVID-19 pandemic on diagnosis and treatment of cancer has been pointed out, its effect on deaths due to adult T-cell leukemia-lymphoma (ATL), which is unique to Japan due to the regional accumulation of human T-cell leukemia virus type 1 (HTLV-1), has not been examined. We analyzed the secular trend of deaths from ATL in Japan and then examined the effect of the COVID-19 pandemic.

Methods : The number of deaths due to ATL by sex and age from 2000 to 2023 was obtained from the Vital Statistics, and the Japanese population by sex and age as of October 1 of each year was obtained from Population Estimates. Of these, those aged 50 years or older, who account for the most of deaths due to ATL, were analyzed over time by sex and age using data from 2000 to 2019 using a Poisson regression model. Risk ratios were then calculated for each sex, age, and targeted year (i.e., 2020, 2021, 2022, and 2023) using these Poisson regression models as controls, and weighted geometric means were calculated for each sex and targeted year, weighted by the number of populations for that year.

Results : From 2000 to 2019, an average of 534 men (511 of whom were aged 50 years or older) and 486 women (468 of whom were aged 50 years or older) annually died from ATL, and the corresponding numbers were 449 men (441 of whom were aged 50 years or older) and 426 women (422 of whom were aged 50 years or older) from 2020 to 2023. The risk ratios were 0.90 (0.86-0.95) for men and 0.90 (0.86-0.95) for women in 2020, the corresponding numbers were 0.82 (0.78-0.87) and 0.80 (0.76-0.85) in 2021, 0.78 (0.74-0.83) and 0.77 (0.72-0.82) in 2022, and 0.87 (0.81-0.93) and 0.72 (0.68-0.77) in 2023, respectively.

Conclusion : Lower deaths due to ATL were observed in Japan after the beginning of the COVID-19 pandemic.