Repurposing of Eicosapentaenoic Acid for Systemic Lupus Erythematosus: the LIFE Study

Chieko Ishiguro (1)
Yuki Kato (2), Yoshinori Takeuchi (2), Ayaka Ito (3), Naotake Tsuboi (4), Futoshi Oda (5), Megumi Maeda (5)
Takayoshi Suganami (3), Haruhisa Fukuda (5)

1 : Laboratory of Clinical Epidemiology, Department of Data Science, Center for Clinical Sciences, Japan Institute for Health Security
2 : Department of Data Science, School of Data Science, Yokohama City University
3 : Department of Molecular Medicine and Metabolism, Research Institute of Environmental Medicine, Nagoya University
4 : Department of Nephrology, Fujita Health University School of Medicine
5 : Department of Health Care Administration and Management, Kyushu University Graduate School of Medical Sciences

Background : Systemic lupus erythematosus (SLE) is a designated intractable disease. Omega-3 polyunsaturated fatty acids, originally administered as eicosapentaenoic acid (EPA) for dyslipidemia, show SLE-ameliorating signals in mice. However, human studies are limited by small samples, heterogeneity, and inconsistency.

Objective : To estimate intention-to-treat (ITT) and per-protocol (PP) effects of EPA initiation on steroid-defined SLE flares in patients with SLE in sustained remission on maintenance therapy.

Methods : Using the insurer-based LIFE Study database ($\approx$2.2 million residents, 15 municipalities; Apr 2014–Apr 2023), we conducted an active comparator new user cohort study of SLE patients newly dispensed lipid-lowering therapy (first dispensing date = cohort entry date: CED). Inclusion criteria were $\geq$1 year of continuous enrollment, $\geq$3 SLE diagnoses in the prior year, and all steroid prescriptions $\leq$7.5 mg/day; exclusion was concurrent EPA and non-EPA at CED. Exposure was EPA at CED, with the comparator being non-EPA lipid-lowering agents. The outcome was $\geq$2$\times$ the baseline daily steroid dose (baseline = prior year average). Follow-up started from CED; ITT ended at outcome, 1 year, or data end, and PP ended at the end of dispensing continuity (30-day grace), the day before concomitant use, outcome, or data end. Hazard ratios were estimated with an inverse probability of treatment (IPT) weighted Cox model for ITT analysis and an inverse probability of censoring & IPT weighted Cox for PP analysis.

Results : Of 390 participants (76.7% female; mean age 70 years), 39 were exposed and 351 comparators. Steroid-defined flares occurred, in ITT, in 5 exposed (mean follow-up 305.5 days) and 54 comparators (279.7 days); in PP, in 3 exposed (158.6 days) and 39 comparators (172.9 days). ITT HR 0.77 (95% CI 0.31–1.93); PP HR 0.32 (0.08–1.27).

Conclusion : Efficacy was not conclusive, but a benefit trend was observed; larger studies are warranted.

Drivers of rising CT use in Western Australian emergency departments: a decomposition analysis

Fouziah Nawar Almouqati (1,2)

Ninh Ha (3), Ashu Gupta (4), Elizabeth Thomas (1), Colleen Taylor (5), Sharmani Barnard (1), Tracey Bhar (5)
Delia Hendrie (1)

1 : Curtin School of Population Health, Faculty of Health Sciences, Curtin University, Perth, Western Australia, Australia
2 : Health Administration, College of Business Administration, King Saud University, Riyadh, Saudi Arabia
3 : Health Economics and Data Analytics, Curtin School of Population Health, Faculty of Health Sciences, Curtin University, Perth, Western
4 : Radiology Department, Fiona Stanley Hospital, Murdoch, Western Australia, Australia
5 : Emergency Department, Fiona Stanley Hospital, Murdoch, Western Australia, Australia

Introduction : CT use in Australian emergency departments (EDs) has continued to rise despite Choosing Wisely (2015), but the drivers remain unclear. We aimed to quantify the contributions of patient and organizational-level factors to changes in CT use and to assess whether CT is used as a substitute for, or in addition to, X-ray (XR) and ultrasound (US).

Methods : This retrospective study analyzed adult ED episodes at a public hospital in Western Australia (2016–2023) using individual-level administrative data. A multivariable decomposition analysis was applied to estimate the contribution of observed characteristics to changes in the proportion of CT use. A multivariable multinomial logistic regression was used to estimate annual probabilities for each imaging combination.

Results : Between 2016 and 2023, ED episodes decreased by 2.9% (from 70,146 to 68,137), while the proportion of CT use increased by 6.4 percentage points (from 11.3% to 17.7%). Of this rise, 40.2% was explained by shifts in patient characteristics and 59.7% by changes in CT use within these characteristics. Changes in triage distribution (+27.1%) were the main driver of increased CT use, followed by age (+9.3%) and presenting symptoms (+1.4%). The adjusted proportion of CT-only cases increased from 5.8% (95% CI: 5.7–6.0) to 8.2% (95% CI: 8.0–8.4), and CT+XR cases rose from 6.2% (95% CI: 6.0–6.4) to 7.6% (95% CI: 7.4–7.8). In contrast, XR-only cases declined from 34.7% (95% CI: 34.4–35.1) to 32.4% (95% CI: 32.1–32.7). Smaller but significant increases were observed for US-only, CT+US, XR+US, and CT+XR+US.

Conclusions : The disproportionate increase in CT use was only partly explained by changes in patient characteristics. The rise in CT appears largely additive to other modalities, except for X-ray, where partial substitution may be occurring. These findings suggest that practice changes may be influencing CT use, warranting further investigation.

Avoidable Mortality in OECD Countries: Explanatory Roles and Cross-National Clustering Analysis

Eunvin Kang (1)

Young-Joo Won (1)

1 : Department of Health Administration, Yonsei University

Background : Avoidable mortality(<75 years) is a key population health indicator, representing deaths that could be avoided with appropriate prevention and treatment. Differences across countries reflect the interaction of socioeconomic factors, health systems, health behaviors, and environmental exposures. This study assessed the relative contributions and cross-national patterns of these four dimensions across OECD countries.

Methods : 29 OECD countries with data from 2010 to 2019 were included. After calculating the average Z-score of each dimension as an index, hierarchical regression analysis was performed on socioeconomic indicators, health systems, health behaviors, and environment in that order. Changes in explanatory power(R^2, ΔR^2) were assessed, and coefficients were estimated using robust standard errors(HC3). K-means clustering was used to identify groups of countries with similar characteristics.

Results : Avoidable mortality was positively correlated with the health behavior index(ρ =0.58, p<0.001) and the health system index(ρ =0.40, p=0.04). Hierarchical regression analysis revealed that after adding the health system, R^2 increased from 0.42 (socioeconomic index) to 0.70(ΔR^2=0.27, p=0.003), after adding health behaviors, to 0.82(ΔR^2=0.12, p=0.05), and after adding environmental factors, to 0.84 ΔR^2=0.02, p=0.75). Post hoc analysis revealed that the highest-risk cluster had a significantly higher mortality rate than other clusters(Kruskal–Wallis χ^2=12.18, p=0.002).

Conclusion : Avoidable mortality in OECD countries were significantly influenced by health behaviors and health system performance, the impact of environmental factors was limited when other factors were considered. K-means analysis revealed that countries with weak health systems and poor health behaviors had the highest mortality rates. Therefore, strategies that combine health system strengthening and health behavior improvement are needed to reduce national disparities.

A Retrospective Study on Sarcopenia and Associated Factors Using SMI in the general population

Rie Ibusuki (1)

Inria Zahra (1), Rika Matsuyama (1), Chiharu Takada (1), Athira Dhruva (1), Shiroh Tanoue (1), Toshiro Takezaki (2)
Chihaya Koriyama (1)

1 : Kagoshima University/Graduate School of Medical and Dental Sciences
2 : Community Medicine Support Center, Kagoshima University Hospital

Background： Sarcopenia is associated with frailty, physical decline, and increased mortality risk in older adults, with its prevalence rising globally. In Japan, where the aging rate is the highest in the world, sarcopenia is a leading cause of the need for assistance and long-term care. Preventing sarcopenia has become increasingly important in extending healthy life expectancy.

Aimes： To investigate the identify risk and protective factors associated with the development of sarcopenia in the general population using the skeletal muscle mass index (SMI) in a retrospective study design.

Methods： The subjects were 547 individuals (181 men, 366 women) who participated in the baseline survey of the Japan Multi-Institutional Collaborative Cohort (J-MICC) study in Kagoshima Prefecture island region in 2005–2006, for whom survey questionnaires and health examination information were available, who participated in the follow-up survey 18 years later in 2023–2024, and who underwent body composition measurement using InBody. Sarcopenia was defined based on skeletal muscle mass index (SMI) thresholds set by AWGS2019 using the BIA method—men with SMI <7.0 kg/m² and women with SMI <5.7 kg/m² were classified as sarcopenic. Odds ratios (OR) for sarcopenia development were estimated using a logistic regression model, adjusting for sex, age, BMI, physical activity levels, exercise habits, energy intake, protein intake, and educational background as relevant factors.

Results： The mean age of participants was 71.9 years, with 23.0% of individuals classified as sarcopenic (5.3% for men and 17.7% for women). The odds ratio for impaired glucose tolerance was 3.75 (1.70-8.29), indicating an increased risk for sarcopenia, whereas obesity showed a decreased risk with an OR of 0.14 (0.68-0.27).

Conclusion： Impaired glucose tolerance was suggested as an independent risk factor for the development of sarcopenia.

A Study on the Intractable Diseases Based on the Survey on Difficulty in Living of 2024

HIDETO TAKAHASHI (1)

MASAAKI OTAGA (2), FUMIE SHIGETA (3), KAORI YAMAGUCHI (2)

1 : TEIKYO HEISEI UNIVERSITY

2 : National Institute of Public Health/Department of Health and Welfare Services

3 : Rikkyo University/College of Community and Human Services Department of Social Work

Background : ICD-11 introduced Chapter V to link diseases with functioning, integrating WHODAS 2.0, the Model Disability Survey (MDS), and elements of general functioning. This framework emphasizes connecting functioning with disease and mortality statistics. The *Survey on Difficulty in Living* provides data on functioning and diseases, including intractable and mental disorders. This study examined intractable diseases in the survey in relation to the International Classification of Functioning, Disability and Health (ICF).

Methods : We analyzed individual-level data from the FY2022 survey. Intractable diseases were defined by Q11 responses: (2) designated disease with medical expense certificate, (3) designated disease without certificate, (4) disease listed in the supplementary table, or (5) other intractable disease. Functioning was assessed using 13 Q15 items (e.g., eating, dressing, bathing, shopping, money and medication management, communication), rated on a five-point scale (1 = independent to 5 = unable without assistance). Frequently reported diseases were mapped to ICF categories, and mean scores compared.

Results : In five disease groups, down syndrome had the highest mean score (3.1, SD 1.0), indicating substantial support needs. Rheumatoid arthritis (1.6, 0.4), sudden sensorineural hearing loss (1.5, 0.2), and age-related macular degeneration (1.6, 0.4) showed mild limitations. Idiopathic bilateral sensorineural hearing loss had the lowest impairment (1.3, 0.2). In Down syndrome, difficulties were most evident in instrumental activities such as shopping, money, and medication management.

Conclusion : Functional limitations differ across intractable diseases. While some conditions showed minor difficulties, Down syndrome involved marked impairments, particularly in instrumental daily activities. Linking disease and functioning through the *Survey on Difficulty in Living* is useful for understanding daily impact based on the ICF framework.