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Media Contacts:
Renee Tessman, rtessman@aan.com, (612) 928-6137
Michelle Uher, muher@aan.com, (612) 928-6120

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Abstract Title: Sleep, Physical Activity, and Incident Amyotrophic Lateral Sclerosis: A Large Prospective Cohort Study of Over 500,000 Participants

Press Release Title: Being an early bird, getting more physical activity linked to lower risk of ALS

Authors: Hongfu Li[1], Jiali Xie[1]
[1]Department of Neurology, Second Affiliated Hospital, Zhejiang University School of Medicine

Objective: This study aimed to examine the associations between sleep traits, physical activity, and the risk of Amyotrophic Lateral Sclerosis (ALS)

Background: Sleep behavior and physical activity are closely linked to neurodegenerative diseases. However, compared with Alzheimer's disease, research on ALS is limited and findings remain inconsistent.

Design/Methods: A total of 502,279 participants aged 37–73 years were enrolled in a large-scale prospective cohort from 2006 to 2010. ALS incidence was identified using the International Classification of Diseases, 10th Revision (ICD-10). Baseline sleep traits and physical activity were assessed via standardized questionnaires. Cox proportional hazards models and restricted cubic spline analyses were performed.

Results: A total of 502,279 participants were included, with a mean baseline age of 56.5 years, 45.6% of men, and 94.5% of white. After a median follow-up of 13.74 years, 675(0.14%) incident ALS events were documented. In sleep traits, a U-shaped association was observed between sleep duration and ALS risk (P for non-linearity = 0.002). An early chronotype was associated with reduced ALS risk after adjusting for age, sex, BMI, and other covariates (HR = 0.80, 95% CI: 0.67–0.96, p = 0.018). In physical activity, higher exercise (≥600 MET-min/week) was inversely associated with ALS (HR = 0.74, 95% CI: 0.59–0.93, p = 0.011). Additionally, a higher healthy activity score served as a protective factor (HR = 0.83, 95% CI: 0.71–0.96, p = 0.015). These associations remained robust in sensitivity analyses.

Conclusions: Early chronotype and higher levels of physical activity were associated with a lower risk of ALS. Promoting healthy lifestyle behaviors may represent a potential strategy to mitigate ALS risk.