## Aging and Developmental Issues

### AGE ASSOCIATED CHANGES IN SLEEP SPINDLE CHARACTERISTICS IN VIPASANA MEDITATOR: A WHOLE NIGHT POLYSOMNOGRAPHY STUDY

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**Introduction:** With normal aging process, the notable changes in micro-sleep architecture is observed in sleep spindles − a signature of thalamocortical oscillation during sleep. Reduction of sleep spindle density, duration and amplitude, a shift from fast to slow spindles and decrease in the spindle power are the prominent changes that are associated with ageing. There are many reproducible evidences demonstrating the neural plasticity changes brings about strengthening of thalamocortical network by long-term vipassana (mindfulness) meditation practices. We have earlier reported that long-term practice of Vipassana meditation can bring about enhanced N3 and REM sleep stage when compared to age matched non-mediating controls. In this study, we aimed to assess the sleep spindles characteristics during NREMsleep stage N2 to understand the effect of aging in long term vipasana practitioners.

**Materials and Methods:** Whole-night polysomnography was conducted on healthy male (30-60 years, meditators = 49, control=61) subjects. Meditators were practicing regularly Vipassanameditation. Controls were healthy non meditating age matched participants. All the participants underwent two consecutive whole night polysomnographyand sleep was scored offline with Polymansoftware as per ASSM guidelines. YASA spindle detection algorithm was used to identify and analyses the sleep spindle characteristics during N2 sleep stage. Mann−WhitneyUand Spearman's correlation was applied.

**Results:** Whole night polysomnography recordings that demonstrated sleep efficiency index more than 85% were considered for the analysis, thus the analysis was only among good sleepers. Meditators showed significantly reduced N2 (control =185±54.88, meditators =165.55±47.44, p=0.037) and increased REM (control =58.87±25.05, meditators =75.49±39.00,p=0.01) sleep duration when compared to controls. The spindle duration (controls r=-0.43,p=<0/001, meditators, r=-0.29, p=0.04)and number of spindle oscillations(controls r =- 0.45, p=<0/001, meditators r= - 0.29, p=0.05), showed a significant negative correlation with age in both the groups, however, the changes in meditators were significantly less than the controls. Meditators showed a trend towards lower spindle density (control =270.16±128.65, meditators =218.52±98.77, p=0.023). Other sleep spindle characteristics amplitude and spindle frequency were comparable with controls and showed a similar declining trend with ageing.

**Conclusions:** Changes in the sleep spindle characteristics is the foremost physiological changes observed with normal ageing process. We observed similar age related changes in sleep spindle characteristics both in controls and meditators, however, such changes were less in meditators. There are report demonstrating reduced spindle density associated with better cognitive performance in a nap among experienced vipassana meditators which is attributed to efficiency of thalamo-cortical network. In accordance, in the present study, we are reporting from whole night polysomnography data that the impact of ageing on sleep spindle modulation is less pronounced in long-term Vipassana meditators than controls, which probably could be due to neural plasticity changes.

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### ASSOCIATION BETWEEN AGE AND SLEEP QUALITY: FINDINGS FROM A COMMUNITY HEALTH SURVEY

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**Introduction:** This study aimed to investigate the changes in sleep quality with increasing age and the effect of age on the components of the Pittsburgh Sleep Quality Index (PSQI).

**Materials and Methods:** We used data from the Community Health Survey conducted by the Korea Center for Disease Control and Prevention in 2018. A total of 228340 participants in this nationwide survey.

Sleep quality was assessed using the PSQI. Adults aged $\geq$ 19 years were divided into six age groups and one-way analysis of variance (one-way ANOVA) was used to compare the mean values of PSQI of each group. By comparing the scores for each PSQI component in those aged $\geq$ 65 years and < 65 years, we aimed to reveal the differences in special components according to age group.

**Results:** In total, 223334 respondents were included in the study. Based on a one-way ANOVA, the PSQI score generally increased with age. Although the average PSQI score of patients in their 40s was lower than that of patients in their 30s, there was no significant difference between the two groups (p = 0.11). When the PSQI component was compared between the population aged over and under 65 years, the population aged $\geq$ 65 years scored higher in most components. In contrast, daytime dysfunction scored higher in the population aged < 65 years.

**Conclusions:** Sleep quality tends to decrease with increasing age. Several factors, including physiological changes, underlying physical conditions, and psychosocial factors, may contribute to a decrease in sleep quality with age.

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### ASSOCIATIONS BETWEEN OBSTRUCTIVE SLEEP APNEA, ANTI-INFLAMMATORY INTERLEUKINS, AND CORTICAL B-AMYLOID BURDEN IN COGNITIVELY UNIMPAIRED OLDER ADULTS

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