Poster 44

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Age-related changes in the association between REM sleep and the polygenic risk for Parkinson's disease

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Parkinson's disease (PD) is one of the rare diseases for which sleep alteration is a true marker of disease outcome. How the association between sleep and PD emerges over the healthy lifetime trajectory is not known. We examined association between polygenic risk score (PRS) for PD and the variability in the sleep electrophysiology in a large sample of 415 individuals. In this prospective observational study, in-lab EEG recordings of habitual sleep were conducted with automatic scoring of sleep stages, artefact detection and additional energy bands computation. We also extracted DNA from saliva/blood for PRS determination. Summary statistics of large PD GWAS was used to compute PRS using SBayesR approach. Generalized Additive Model for Location, Scale and Shape (GAMLSS) regression showed significant association for REM duration and theta in REM as dependent variables with PD PRS while controlling for age, sex, BMI and total sleep time or REM duration. In the younger cohort, the analysis revealed positive association of REM duration (p=.002; _:0.004) and REM theta energy (p =.019; _: 0.01) with PD PRS. In contrast the analysis of the older cohort, revealed negative association of REM duration (p=.004; _:-0.01) with PRS and yielded a significant interaction of age with PRS for REM theta energy (p<.0001; _: 0.003). Our findings show that REM sleep is associated with the polygenic risk for developing PD in age dependent manner. A higher risk for PD is associated with higher REM duration and REM sleep intensity during early adulthood while it is associated with lower REM duration and REM sleep intensity after 50y. This reveals a switch in the association between younger, presumably free of alpha-synuclein inclusions, and older healthy individuals in which low levels of these inclusions may be present. These findings may contribute to unravelling the core association between PD and sleep and to the identification of novel intervention targets to prevent or delay PD.