Heart Rate Variability and Sleep-Related Breathing Disorders in the General Population

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Obstructive sleep apnea seems to have an important influence on the autonomic nervous system. In this study, we assessed the relations of sleep apnea-related parameters with 24-hour heart rate variability (HRV) in a large population of young and healthy adults. Participants aged 25 to 41ăyears with a body mass index <35ăkg/m(2) and without known obstructive sleep apnea were included in a prospective population-based cohort study. HRV was assessed using 24-hour electrocardiographic monitoring. The SD of all normal RR intervals (SDNN) was used as the main HRV variable. Apnea-Hypopnea Index (AHI) and oxygen desaturation index (ODI) were obtained from nighttime pulse oximetry with nasal airflow measurements. We defined sleep-related breathing disorders as an AHI $\geq$5 or an ODI $\geq$5. Multivariable regression models were constructed to assess the relation of HRV with either AHI or ODI. Median age of the 1,255 participants was 37ăyears, 47% were men, and 9.6% had an AHI $\geq$5. Linear inverse associations of SDNN across AHI and ODI groups were found (p for trendă= 0.006 and 0.0004, respectively). The β coefficients (95% CI) for the relation between SDNN and elevated AHI wereă-0.20 (-0.40 toă-0.11), pă= 0.04 andă-0.29 (-0.47 toă-0.11), pă= 0.002 for elevated ODI. After adjustment for 24-hour heart rate, the same β coefficients (95% CI) wereă-0.06 (-0.22 to 0.11), pă= 0.51 andă-0.14 (-0.30 to 0.01), pă= 0.07, respectively. In conclusion, even early stages of sleep-related breathing disorders are inversely associated with HRV in young and healthy adults, suggesting that they are tightly linked with autonomic dysfunction. However, HRV and 24-hour heart rate seem to have common information.
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