

Quantification of muscle activity during sleep for patients with neurodegenerative diseases - DTU Orbit (08/11/2017)

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Idiopathic REM sleep behavior disorder (iRBD) is a very strong predictor for later development of Parkinson's disease (PD), and is characterized by REM sleep without atonia (RSWA), resulting in increased muscle activity during REM sleep. Abundant studies have shown the loss of atonia during REM sleep, but our aim was to investigate whether iRBD and PD patients have increased muscle activity in both REM and NREM sleep compared to healthy controls. This was achieved by developing a semi-automatic algorithm for quantification of mean muscle activity per second during all sleep stages for the enrolled patients. The three groups examined included patients suffering from iRBD, PD and healthy control subjects (CO). To determine muscle activity, a baseline and threshold were established after pre-processing of the raw surface electromyography (sEMG) signal. The signal was then segmented according to the different sleep stages and muscle activity beyond the threshold was counted. The results were evaluated statistically using the two-sided Mann-Whitney U-test. The results suggested that iRBD patients also exhibit distinctive muscle activity characteristics in NREM sleep, however not as evident as in REM sleep, leading to the conclusion that RSWA still is the most distinct characteristic of RBD. Furthermore, the muscle activity of PD patients was comparable to that of controls with only slightly elevated amplitudes.

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