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Introduction: Previous studies showed that idiopathic REM sleep behavior disorder (iRBD) patients are at high risk for mild cognitive impairment (MCI) and dementia, with cognitive impairment being mostly in attention and executive functions. However, no study to date has measured judgment abilities in this population, despite their association with executive measures and their importance in daily life. The aim of this study was to investigate judgment abilities of iRBD patients in association with their cognitive status.

Methods: We recruited 50 control participants (age: 69.06±4.47 years; education: 14.64±3.14 years) and 70 iRBD patients confirmed by polysomnography (age: 68.35±7.57 years; education: 13.91±3.47 years), including 21 patients with MCI diagnosed by a comprehensive neuropsychological assessment. We used the Judgment Assessment Tool (JAT), a test validated with adults with and without cognitive impairment, to measure judgment abilities. The JAT is divided in two sections to assess two core aspects of judgment, namely generation of solutions and assessment of options. We used ANCOVA to compare judgment capacities (raw scores) between the three groups, with age and education as covariates, and Bonferroni post hoc comparisons.

Results: IRBD patients with MCI (mean: 11.38±3.08), iRBD patients without MCI (mean: 13.12±3.28), and controls participants (mean: 12.10±2.78) had similar results for the generation of solutions (p=.507). IRBD patients with MCI (mean: 7.33±3.17) performed worse than controls (mean: 10.32±2.17) and iRBD patients without MCI (mean: 10.84±2.66) for assessing advantages and disadvantages of options (p=0.011).

Conclusions: This study shows that impaired judgment capacities are linked to cognitive impairment in iRBD patients and that the main process involved is related to lower abilities in the assessment of options. Clinicians should be aware that iRBD patients with cognitive impairment could have limited judgment capacities. Future prospective studies should investigate if impaired judgment capacities are a cognitive marker of future neurodegeneration in iRBD patients.

REM Behavior Disorders

HOW DOES DEMENTIA WITH LEWY BODIES START? PRODROMAL COGNITIVE CHANGES IN REM SLEEP BEHAVIOR DISORDER

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Introduction: Neurodegeneration starts decades before the clinical diagnosis, offering an opportunity to detect and manage individuals in preclinical stages. REM sleep behavior disorder (RBD) is a parasomnia in which approximately half of patients who develop a neurodegenerative disorder are diagnosed with dementia. A systematic assessment of the evolution of cognitive alterations has never been performed in this population. Here, we describe the progression of cognitive decline and identify the predictive values of cognitive tests in three groups of RBD patients defined at their last follow-up as: disease-free, Parkinson's disease (PD), or dementia with Lewy bodies (DLB).

Materials and methods: Patients (n=109) underwent polysomnography, neurological, and neuropsychological assessments. We used linear mixed-model analyses to compare the progression of cognitive performance on tests between the three groups in a three-year prodromal period. We also compared the proportions of patients with clinically impaired performance (z scores of -1.5). In addition, patients who developed DLB were pair-matched according to age, sex, and education to healthy controls (2:1), and receiver operating characteristic curves were performed to identify the psychometric properties of cognitive tests to predict dementia.

Results: At follow-up, 38 patients (35%) developed a neurodegenerative disease: 20 PD and 18 DLB. Cognitive performance changes through years were strongly associated with later development of dementia. Impairments in attention and executive functions and in learning and memory were noticeable two to three years before diagnosis, and one year preceding diagnosis in visuospatial abilities. The Trail Making Test (part B), Verbal Fluency (semantic), and Rey Auditory-Verbal Learning Test (total, immediate and delayed recalls) were the best predictors for dementia (area under the curve > 0.90).

Conclusions: Progression of cognitive decline in late prodromal stages identify DLB in RBD patients. Some cognitive tests detect RBD patients at imminent risk of dementia and might be used to assess the effectiveness of intervention trials to prevent cognitive deterioration in this population.

REM Behavior Disorders

ENVELOPE ANALYSIS OF ELECTROMYOGRAM IN REM SLEEP BEHAVIOR DISORDER PATIENTS

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Introduction: Clinical manifestations of REM Behavior Disorder (BRD) include REM sleep without atonia (RWA) characterized by maintenance of muscle tonus associated to intense and frequent phasic motor events during REM sleep episodes. The diagnosis of RBD includes the enaction of dreams, i.e. the patient displays complex vocal and motor behaviors during REM sleep that may reflect dream content and the polisomnographic recording of RWA. There is a growing interest in RWA, as it has been considered a prodromal manifestation of neurodegenerative alpha-synucleinopathies such as Parkinson's disease. Current clinical diagnostic procedures include the visual inspection of polysomnographic record and categorization of electromyographic (EMG) events. Automated (computer based) strategies has been proposed to assist in EMG scoring to maximize diagnostic accuracy. Here we apply envelope analysis to EMG records obtained in healthy subjects and RBD patients. Envelope analysis give qualitative information regarding the underlying mechanism of signal generation.

The mathematical properties of CVE distribution may help to obtain an unbiased scoring of electromyographic (EMG) events during sleep. The numeric value acquired by CVE is a reporter of the temporal structure of recorded elements, where phasic or pulsatile events adopt high CVE values and can be unequivocally discriminated from non pulsatile intervals. The amplitude of the envelope (AE) of EMG is directly related to muscle tonus. We propose that characterization CVE and AE may help to assist in identify RWA.

Materials and methods: Polysomnographic records of healthy patient (n=10) were obtained from ambulatory video-polysomnography (v-PSG), that includes EEG, EMG, EOG and respiratory parameters. Polysomnographic records of RBD patients (n=10) were obtained from three sources: open databases (physionet.org), a collaborative project with Universitäts Klinikum Tübingen and ambulatory v-PSG of patients with suspected RBD. Manual EEG scoring was performed at 30 second time resolution (epochs). Muscle tonus and phasic activity were evaluated in three different muscles: chin and bilaterally in flexor digitorum superficialis (forearm).

Results: Whole night 30-second epochs of chin and forearms EMG were projected in a CVE vs. AE phase portrait. The portrait was mapped to discriminate high AE (high tone) and high CVE (phasic or twiches) epochs respect to low AE and CVE (low muscle tone and non-pulsatile) epochs of the EMG. REM sleep epochs of healthy subjects cluster around a minimal amplitude and non-pulsatile region of the CVE vs AE phase portrait. Chin EMG exhibit higher amplitude as compared to forearm EMG, and both presented sporadic phasic events. REM sleep epochs of RBD patients exhibit a scattered distribution with increased density in the high AE and CVE region. The ratio of (high AE+high CVE)/(low AE + lowCVE) epochs was obtained for

healthy and RBD patients. Ratios obtained for chin EMG among healthy patiens ranged form 0.2 to 0.4, in contrast that of RBD patiens were always >1.
Conclusions: Envelope analysis may be a powerful tool in assisting RBD medical diagnosis.

Chronobiology/Circadian Disorders
ASSOCIATION BETWEEN PANDAS (PEDIATRIC AUTOIMMUNE NEUROPSYCHIATRIC DISORDER ASSOCIATED WITH STREPTOCOCCI) AND NON 24-HOURS SLEEP WAKE DISORDER

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Introduction: PANDAS is sudden acute and debilitating onset of intense anxiety and mood lability accompanied by Obsessive Compulsive-like issues and/or Tics, in association with a streptococcal-A (GABHS) infection that has occurred immediately prior to the symptoms (Swedo et al. 1998).
Non 24-hours sleep-wake disorder (N24SWD) is characterized by symptoms of insomnia or excessive sleepiness that occurs because the intrinsic circadian pacemaker is not entrained to a 24-hour Light/dark cycle. Affected individuals have a sleep-wake cycle of 24.5 hours (Okawa et al. 2007). The disorder is seen in 70% of blind persons; among people with conserved vision it is a rare pathology. Among sighted cases, 80% are young males (Hayakawa et a. 2005) and 28% have a psychiatric disorder (Kokkoris et al. 1978).
Materials and methods: Victor is a 14-year-old boy diagnosed with Pandas in 2015. In conjunction with psychiatric symptoms he presents an irregular sleep pattern that was diagnosed as a non-24-hour sleep-wake disorder, with a 25 h sleep/wake cycle, studied using the novel circadian monitoring system Kronowise® (Chronolab, Universidad de Murcia) (Sarabia et al. 2008).
The first treatment approach for Victor was focused on improving symptoms during the acute infection and psychiatric symptoms. Sleep pathology was treated with different treatments such as light therapy and melatonin.
Results: After 8 months and different trials, it was possible to normalize its symptoms and fix its sleep rhythm in a normal schedule (21h-6 h).
Conclusions: The association between Pandas and non-24 hours sleep-wake disorder had not been previously reported in the literature.
Light therapy and melatonin administration have allowed to stabilize the sleep circadian rhythm of the patient, being a crucial adjuvant to the control of anxiety disorder due to PANDAS.

Psychiatric Disorders Affecting Sleep/Wake
EFFECTS OF SLEEP APNEA ON DEPRESSION

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Introduction: In human, depression is generally thought to be associated with undiagnosed OSA or sleep problems. The aim of this study is to analyze the effects of sleep apnea patients underwent overnight polysomnography on depression.
Materials and methods: Data collections of 105 sleep apnea patients in an General Hospital. Dependent variable ; BDI(Beck depression inventory), Independent variables ; Biological data(BMI, Neck circumference, Waist), Polysomnography data[AHI(Apnea-hypopnea index), RDI(Respiratory disturbance index), Mean SpO2, Minimum SpO2, Snoring Index(PSG) PSQI(Pittsburgh sleep quality index), ESS(Epworth sleepiness scale), SI(Snoring index by scale)] Statistics ; IBM Statistics 23.0, hypothesis testing by multiple regression analyses.
Results:

(1) Independent t test -Sex differences of variables(Statistically significant) ; Neck circumference(p=0.000), Waist(p=0.001), WASO (p=0.028), AHI(p=0.005), Supine AHI(p=0.001), RDI(p=0.005), Supine RDI(p=0.001), Snoring Index(PSG, p=0,008), Mean SpO2(p-0.025)
(2) Multiple regression analyses- Effects of sleep variables(Predictor : BDI) ; Step1 PSQI B=0.6999, β=-0.424***, R2adj=0.172, F=22.55***, Step2 PSQI B=0.546, β=0.331***, SI(snoring index by scale) B=0.364, β=0.271, R2adj(ΔR2adj)=0.230(0.058), F=6.519***(** p< 0.01 *** p< 0.001).

Conclusions: Sex differences of sleep variables suggest poorer results in men with sleep apnea. The above results show that poor sleep quality and increased snoring will provoke incidence of depressive disorder in sleep apnea patients. Also, the above results suggest that sleep apnea have causality with depression and men are more vulnerable than women in the occurrences of depression by sleep apnea.

Excessive Daytime Sleepiness (not Narcolepsy)
REVISED DIAGNOSTIC CRITERIA FOR IDIOPATHIC HYPERSOMNIA: A 32-HOUR BED-REST PROTOCOL

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Introduction: The diagnosis of idiopathic hypersomnia (IH) is based on a body of clinical and electrophysiological arguments, which have limitations, and no reliable biomarkers were discovered so far. The aim of this study is to assess the diagnostic value of extended sleep duration for the diagnosis of IH on a controlled 32-hour bed-rest protocol, in order to propose more specific diagnostic markers.
Materials and methods: One hundred sixteen patients with primary hypersomnolence (91 women; median age 26.1) and 21 controls (12 women; median age 27.6) were recruited. Thirty-seven patients (28 females; median age 27.29) were diagnosed IH according to stringent multiple sleep latency test (MSLT) criteria, the remaining 79 (63 females; median age 25.33) were classified as non-specified hypersomnolence (NSH). All participants underwent a polysomnography and a modified-MSLT followed by a 32-h bed-rest protocol to obtain the maximum spontaneous amount of sleep. Receiver operating characteristic curves were used to find optimal total sleep time (TST) cut-off values on various periods of the 32-h recording (32 hours, first and last 24 hours, daytime), that discriminate IH to controls. Clinical and polysomnographic characteristics of NSH and whole patients with hypersomnolence were then compared according to best thresholds.
Results: Best cut-off was 19 hours for the 32-h recording (sensitivity 91.9%, specificity 85.7%) and 12 hours for the first 24-h (sensitivity 100%, specificity 85.7%), while 11 hours on the first 24-h showed a sensitivity of 100% and specificity of 57.14%. Patients with hypersomnolence above the 19-h cut-off were significantly overweight, had more sleep inertia and higher TST on all periods of the 32-h recording, compared to patients below this threshold. No clinical differences were found between patients with TST above and below the 12-h cut-off. An inverse correlation was found between the mean sleep latency (MSL) on MSLT and TST during 32-h recording in patients with hypersomnolence, but not in controls. Moreover, patients with MSL below 8 minutes had higher TST during the 32-h recording than patients above this threshold.
Conclusions: In standardized and controlled conditions, the optimal cut-offs best discriminating patients to controls were 19 hours over 32-h and 12 hours over 24-h recording, while the current accepted 11-h cut-off showed a poor specificity. Threshold of 19 hours allowed a better phenotypical characterization. Moreover, sleepier patients on MSLT were also the more severe in terms of extended sleep, that favor a continuum between the forms with and without long sleep time of IH.