JOURNAL OF SLEEP AND SLEEP DISORDERS RESEARCH
ISSN 0161-8105

SLEEP

VOLUME 35, 2012 | ABSTRACT SUPPLEMENT

26th Annual Meeting of the Associated Professional Sleep Societies, LLC

Boston, Massachusetts

Scientific Highlights/Abstracts of Original Investigations

Click on the buttons below to jump to sections.

Official publication of the
Associated Professional Sleep Societies, LLC

A joint venture of the
American Academy of Sleep Medicine
and the Sleep Research Society

ful for stratifying patients to determine who is most likely to respond to treatment, using an inexpensive and noninvasive tool.
Support (If Any): NIH R01-HL092347, "New Data Analysis Methods for Actigraphy in Sleep Medicine" (Shannon, PI).

0370

DOSE-RELATED EFFECTS OF CAFFEINE: SENSITIVITY OF A PORTABLE SLEEP MONITORING DEVICE

Koshorek J, Roth T, Eklov S, Kluck S, Drake C
Sleep Disorders & Research Ctr, Henry Ford Hospital, Detroit, MI, USA

Introduction: A previous study, using the portable Zeo sleep monitor-ing device (SMD), showed that a moderate dose (400mg) of caffeine can significantly disrupt sleep, even if consumed six hours prior to bed- time. Current literature provides minimal content regarding the SMD. The present study utilized the known dose-related effects of caffeine on sleep-wake parameters to measure the sensitivity of the SMD.
Methods: Total of 16 subjects, 1.8% data loss; 3 subjects excluded: 2 due to ≥ 60min of data loss ≥ 1 night, 1 due to non-compliance. Using a double-blind crossover, Latin square design, 13 normal sleepers (6M, 7F, 47 ± 9.53 years) were given placebo or caffeine (75mg, 150mg, 300mg) 90 minutes prior to bedtime on four nights, one recovery night between treatment nights. The SMD wirelessly measured and automatically scored sleep-wake parameters (time in bed (TIB), latency to persistent sleep (LPS), stage 1 and 2 sleep (S12S), slow wave sleep (SWS), rapid eye movement (REM), wake time during sleep (WTDS), wake after sleep onset (WASO) and total sleep time (TST)) using validated algorithms. Data was analyzed using repeated-measures ANOVA.
Results: Linear dose effects were seen for TST (p=.01), WASO (p=.02) and SWS (p=.01). Compared to placebo, 150mg of caffeine significantly reduced S12S (-25.1min, p=.029), WASO (-14.3min, p=.001) and TST (-36.2min, p=.006). Compared to placebo, 300mg of caffeine significantly reduced SWS (-9.4min, p=.016) and WASO (-21.8min, p=.045). Although not statistically significant, LPS increased with higher doses of caffeine (placebo: 13.3min, 75mg: 17.0min, 150mg: 20.7min, 300mg: 19.4min). Caffeine produced no significant effect on REM sleep.
Conclusion: The SMD, used to objectively measure sleep-wake parameters at home, is sensitive to the known dose-related effects of caffeine on sleep. As in this study, dose-related effects of pharmacological interventions can be objectively detected by the SMD in the "home" environment of individuals.

0371

EEG COMPLEXITY IS ALTERED IN PATIENTS WITH CPAP-INDUCED REM REBOUND

Wang L, McCarty DE, Carrubba S, Uysal A, Chesson AL, Marino AA
Neurology, LSU Shreveport, Shreveport, LA, USA

Introduction: Obstructive sleep apnea (OSA) may decrease REM sleep during diagnostic polysomnography PSG (dPSG). Some of these patients exhibit CPAP-associated REM rebound (CARR), a process that must involve changes in brain electrical activity. We hypothesized that EEG changes could be detected during REM sleep in CARR patients using a novel nonlinear method for extracting physiological information from the EEG (recurrence analysis).
Methods: Records of consecutive patients who underwent dPSG positive for OSA (AHI ≥5) and a subsequent CPAP titration PSG (cPSG) were reviewed (minimum REM, 10 min/study). CARR was identified as an increase of >10% in REM sleep, or an increase of ≥ 45 minutes in the longest continuous REM cycle. The first 5 paired studies in the CARR and non-CARR groups meeting inclusion criteria were analyzed. The recurrence variable percent R (%R) was employed to quantify the amount of determinism in the EEG during REM (F3/F4/C3/C4/O1/O2). %R is a quantitative measure of the deterministic structure in the EEG (structure governed by law rather than chance). %R is lowest during stage W (EEG most "complex") and highest in N3 sleep. Spectral analysis (a linear method) was used as a control.
Results: In the CARR group, REM % as a fraction of total sleep increased significantly in the cPSG, as expected. The complexity of brain electrical activity during REM decreased significantly, as evidenced by higher %R (which correlates with deeper sleep). The effect on %R de- pended on electrode derivation and was greater in the earlier part of the cPSG. Brain-activity changes were not detected using spectral analysis. In the non-CARR group, no changes in percent REM sleep or complexity of brain activity during REM were seen in the cPSG compared with the dPSG.
Conclusion: Deeper REM sleep occurs in patients exhibiting CARR, as evidenced by quantitative changes in the complexity of the EEG.

0372

LABORATORY POLYSOMNOGRAPHY VERSUS AMBULATORY POLYSOMNOGRAPHY: ARE RECORDED SLEEP PARAMETERS JEOPARDIZED OUTSIDE A LABORATORY SETTING?

Diaz-Piedra C[1], Guglielmi O[1], Olmedo AC[1], Hita E[1], Catena A[2], Buela-Casal G[1]
[1]Laboratory of Psychophysiology, University of Granada, Granada, Spain, [2]Experimental Psychology, University of Granada, Granada, Spain

Introduction: Laboratory-based polysomnography (PSG) is the gold standard for the diagnosis of several sleep pathologies. However, some pragmatic difficulties of this method have promoted the development of protocols aimed to obtain good objective measures of sleep quality. In everyday conditions, ambulatory PSG can be a choice, although it have been demonstrated that variations in sleeps patterns are linked to environmental factors, as altitude, humidity, noise, light, or temperature, that also have an impact of human health . The main aim of this study was to test whether polysomnographic values of sleep architecture are sensible to variations in natural ambient (unattended ambulatory PSG) in comparison with standard sleep laboratory setting in healthy adults.
Methods: Thirty-six healthy young adults (age: 22.6 ± 2.1 years; range: 20-28; 29 females) volunteered for overnight PSG assessment along four consecutive days. The PSG recordings were conducted in four lo- cations: mountain (1,500 m), sea level, cave-house (a common environment in some parts of the south of Andalusia, Spain) (900 m), and laboratory (500 m). Participants did not suffer from sleep disorders or other illnesses that affect sleep, and were medication-free. MANOVA was used to take care of correlations between the dependent variables, REM sleep, non- REM sleep stages 1, 2, and slow wave sleep as percentages of total sleep time (%TST), awakenings, sleep efficiency and several sleep indexes (SpO2, ODI, AHI, and arousal index).
Results: There were no significant statistical differences between environments in the multivariate analysis (p = .637).
Conclusion: This study shows that environmental factors associated with usual human settlements do not have a significant impact on sleep architecture parameters. Ambulatory PSG might be considered a valid method for the objective evaluation of sleep characteristics in non-laboratory settings.
Support (If Any): This study was supported by a contract of research C-3511 (funded by Andalusian Government and European Union and administered by Fundación General Empresa-UGR) and by FPU AP 2007-2965 Spanish national grant (C. Diaz-Piedra).