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# ENHANCING SLEEP IN PROFESSIONAL RUGBY PLAYERS: OBSERVATION AND SLEEP INTERVENTIONS

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**Method:** E2006-J086-311 was a 1-month, multicenter, randomized, double-blind, PBO-controlled, parallel-group study evaluating efficacy and safety of LEM 10 mg (LEM10) in Chinese subjects ( $\geq 18$  years) meeting criteria for insomnia disorder. Pairs of PSG were conducted during a single-blind PBO run-in (baseline), after the first 2 doses of LEM10 or PBO, and after the last 2 doses at the end of 1 month. Analyses included change from baseline (CFB) in latency to persistent sleep (LPS; min), sleep efficiency (SE;%), wake-after-sleep-onset (WASO; min), and total-sleep-time (TST; min). Based on previous experience, LPS is expected to be non-normally distributed, hence the statistical analysis plan pre-specified log transformation of the data prior to analysis. However, even after log-transformation, the LPS data did not have a normal distribution. Therefore, using the pre-specified log-transformed approach was not appropriate for this study. Box-Cox transformation was required to correct the skewness of raw LPS data.

**Results:** The full analysis set comprised 193 subjects (100 PBO; 93 LEM10); median age was  $\sim 42$  years and 74.0% (PBO)/61.3% (LEM10) were female. Baseline values (mean  $\pm$  SD) for PBO and LEM10, respectively, were 67.7 (38.9) and 68.3 (49.5) for LPS, 70.3 (10.2) and 69.4 (11.7) for SE, 79.3 (39.6) and 85.8 (44.5) for WASO, and 336.7 (49.1) and 333.2 (56.1) for TST. Because LPS and log LPS were not normally distributed, a Box-Cox transformation that did achieve a normal distribution was applied, which demonstrated nominal statistical significance ( $p = 0.0096$ ); LPS CFB of LEM10 compared with PBO was  $-17$  min. At 1 month, LEM10 showed larger and statistically significant CFB (improvements) in SE, WASO, and TST. Overall, LEM10 was well tolerated, with no new safety signals compared with the known safety profile.

**Conclusion:** Based on the efficacy and safety profile, lemborexant may be an important potential treatment option for Chinese patients with insomnia.

**Conflict of Interest:** Yes- Employee of Eisai Inc.

#### P1304

Poster Session—Other (please specify)—Day 3 (Poster)

#### Orchestral WOMANoeuvres in the dark: A network analysis of dark triad personality traits and chronotypes in biological women

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**Introduction:** Research on the Dark Triad traits—narcissism, psychopathy, and Machiavellianism—has explored their relationship with various aspects of human behavior, including chronotype. Dark Triad traits seem to be correlated with evening preference and in men, often linked to a preference for immediate gratification. Despite a decrease in sex-related prevalence with age, biological men are generally more evening-oriented than women and tend to display more Dark Triad personality traits, irrespective of age. In this study, we aim to investigate the relationship between morningness-eveningness and

Dark Triad personality traits in a sample of female respondents, while controlling for age differences.

**Method:** 201 females (Mage = 31.91, SD = 13.4) completed an online questionnaire including demographics, the Morningness-Eveningness Questionnaire (MEQ), the Big Five Inventory (BFI), the Narcissic Personality Inventory (NPI), the Mach-IV inventory (MACHIV), the Psychopathic Personality Inventory-Revised (PPIr) and the Sensation Seeking Scale (SSS). Chronotypes were classified based on MEQ scores, with  $>50$  indicating a moderate to strong morning preference and vice versa. Group differences were assessed by means of MANCOVA with age as a covariate. A Mixed Graphical Model (MGM) was estimated to reveal stable reciprocal structural relationships between personality (sub)scale scores, chronotype and age. A case-drop bootstrapping with 1000 iterations showed acceptable edge and centrality stabilities ( $< 0.25$ ).

**Results:** Regarding chronotypes and controlling for age, our results show that females with moderate to strong morning preference report higher levels of conscientiousness ( $D = 0.355$ , CI = [0.179; 0.530],  $p < 0.001$ ) and lower levels of neuroticism ( $D = -0.244$ , CI = [-0.429; -0.019]). MGM analysis shows that the strongest connections exist between morning preference and conscientiousness (0.26), narcissism and extraversion (0.26), psychopathic traits and less neuroticism ( $-0.23$ ) and agreeableness ( $-0.23$ ), and similarly between machiavellism and agreeableness ( $-0.21$ ). Sensation seeking seems to be negatively associated with conscientiousness ( $-0.29$ ) and age ( $-0.21$ ), while positively associated with psychopathic traits (0.23).

**Conclusion:** Females with a morning preference tend to exhibit higher levels of conscientiousness and lower levels of neuroticism. We did not observe strong direct relationships between chronotype and Dark Triad personality traits in females. However, our analysis reveals complex relationships among various personality traits, highlighting associations between personality dimensions and chronotype, mitigated by sensation seeking.

**Conflict of Interest:** No.

#### P1305

Poster Session—Other (please specify)—Day 3 (Poster)

#### Optimizing and enhancing sleep quality in athletes: Assessment and intervention

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**Introduction:** Sleep is a crucial factor in recovery and must be integrated into athletes' training plans for optimal performance and well-being. Although athletes are advised to sleep for a minimum of 8 h, many experience shorter sleep durations or exhibit poor sleep efficiency. Sleep tracking observations in athletes suggest that quality is

altered, yet this emerging field of research requires comprehensive assessments, including objective and subjective sleep outputs. To improve sleep quality, sleep interventions have been tested with various modalities, including sleep hygiene education and strategies. Thus, across match weeks, this ecological study aimed to identify good and poor sleepers within a male rugby team, using both objective and subjective assessments, and to evaluate the effects of sleep interventions.

**Method:** Forty-three male professional rugby players from national French rugby union were evaluated during two tracking and intervention match weeks using objective and subjective assessments (actimeter and Hooper questionnaire). During the first tracking week, we assessed the wake-sleep cycle of athletes who maintained their daily habits. Then, two sleep experts reported the results from the tracking phase in a group setting context and offered an educational session on sleep hygiene (30 min). Experts further taught them how to practice relaxation strategies, which they could implement as needed during the post-intervention week.

**Results:** Our findings revealed that 65% of players were bad sleepers. Subjective sleep quality improved between the tracking and the intervention weeks ( $p = 0.002$ ). A significant effect of the sleep interventions was also found on bedtime ( $p = 0.005$ ), which occurred earlier during the intervention week ( $23:25 \pm 00:38$  vs.  $23:43 \pm 00:44$  tracking). A trend towards significant increases in objective (actimetric) sleep quantity was also observed (421.3 min tracking vs. 433.4 min intervention;  $p = 0.07$ ).

**Conclusion:** The first main finding revealed that a majority of rugby players did not sleep sufficiently, which extends previously reported results from different sports. The second main finding demonstrated that sleep interventions improved sleep quality and quantity. This study offers an accessible method for evaluating sleep in team sports athletes, while providing feedback to optimize or enhance sleep quality and quantity.

**Conflict of Interest:** No.

### P1306

#### Poster Session—Other (please specify)—Day 3 (Poster)

#### Additive effects of moderate hypoxia and sleep restriction on mental workload

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**Introduction:** Aircraft pilots have to face high mental workload (MW) under environmental constraints induced by low altitude and sometimes sleep restriction (SR). Our aim was to assess the combined effect of hypoxia and sleep restriction on cognitive and physiological responses to different mental workload levels.

**Method:** Seventeen healthy subjects were subjected in random order to three 12-min periods of MATB-II simulator with an additional auditory task (Oddball), at low, moderate, and high workload levels: sleep restriction (SR, 3 h, Time in bed) versus Habitual sleep (HS, 8 h TIB), hypoxia (HY, 2 h,  $\text{FiO}_2 = 13.2\%$ ,  $\sim 3500$  m vs. normoxia, NO,  $\text{FiO}_2 = 21\%$ ). Following each workload level, participants completed the NASA-TLX subjective mental workload scale.

**Results:** Increasing MATB-II workload level decreases the Tracking task performance ( $p = 0.004$ ), auditory task accuracy ( $p = 0.006$ ) and reaction time ( $p = 0.001$ ), and increases NASA-TLX ( $p = 0.001$ ). In the combined hypoxia and SR conditions, MATB-II performance decreases and NASA-TLX score increases, whereas no effect of hypoxia alone was observed. Concerning physiological responses, hypoxia has higher effect than MW alone on heart rate and index of sympathetic activity. These effects are higher during SR. Increased ventilatory frequency and blinks numbers are associated with the increase of MW, without interaction with hypoxia and SR. Blinks number and duration have the best correlation coefficients with MATB-II performance (Pearson  $R^2 = 0.64 \pm 0.07$ ,  $p < 0.001$  in all conditions). Among these parameters, respiratory (rate and variability), blinks (number and duration) are the best predictors of increased MW, independently of physiological constraints. Additional ECG, SpO2 or electrodermal conductance decrease the model's performances.

**Conclusion:** In conclusion, hypoxia and sleep restriction have an additive effect on MW. Physiological and electro-physiological responses need to be taken into account for the design of a MW predictive model and cross-validation.

**Conflict of Interest:** No.

### P1307

#### Poster Session—Other (please specify)—Day 3 (Poster)

#### Protective effect of a high heat capacity mattress on sleep during heat exposure

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**Introduction:** Sleep is an essential part of physical and psychological recovery in athletes. However, several factors can disrupt their sleep especially during trips. Travel conditions, unfamiliar sleeping environment (light, noise, mattress quality), and unfamiliar environmental conditions (heat, altitude, humidity) can negatively impact sleep quantity and quality. Sleep is strongly affected by heat exposure, through circadian thermoregulation dysfunction. The aim of the present study was to assess the protective effect of a High Heat Capacity Mattress (HHCM) on sleep duration and quality during night heat exposure compared to Control Mattress (CM).