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ACUTE EFFECT OF BLUE LIGHT EXPOSITION ON WELL-BEING AND MELATONIN SECRETION IN HUMANS

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Aim: The aim of this study was to investigate the efficacy of blue light emitting diode units in suppression of melatonin secretion and to evaluate whether a single exposure can improve well being in healthy males and females (20/30) and in 15 women with premenstrual syndrome.

Methods: All study participants were of morning-type with a regular sleep schedule. On control day 1, the subjects were kept under dim illumination (< 10 lx) from 19:00 to 22:30. On day 2, after 1.5h in dim light, the subjects were exposed for 60 min to blue light (12.15 $\mu\text{M}/\text{cm}^2$, TurboLite, Germany) following by 30 min dim light. Blood samples were collected every 30 min for melatonin assay. Zerssen's complaints scale was used to assess mental and physical well-being at 19:00 (pre-test) and at 22:30 (post-test) after dim illumination or blue light exposure. In addition a visual analogue scale (VAS) for sleepiness was applied.

Results: Overall, blue light improved significantly mental and physical complaints from pre-test to post-test (reduction in sum score of the Zerssen's complaints scale by in average 30%) and reduced sleepiness, as measured by the VAS. There were gender-related differences, as well as differences related to the menstrual phase in females. Blue light reduced but not suppressed the gradual increase of melatonin in plasma with time mostly pronounced in the follicular phase.

Conclusion: A single exposition with blue light of low radiant flux density, as applied in our study, seems to be helpful in reducing mental and physical distress.