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A Sleep and Light Intervention that Shifts Melatonin Rhythms Earlier Improves Peri- and Post-Menopausal Depression: Preliminary Findings

Research Question

Will a sleep and light intervention that phase-advances melatonin rhythms improve peri-post menopausal (P-M) depression.

Background

P-M depressed vs. healthy participants have phase-delayed (shifted later) plasma and urinary melatonin rhythms.

Purpose

To determine if correcting circadian rhythms benefits mood.

Methods

We compared: (1) an active, phase-advance intervention (PAI): one night of advanced/restricted sleep from 9pm-1am, followed by 8 weeks of morning bright white light (BWL) for 60 min/day within 30 min of awakening, and (2) a control, phase-delay intervention (PDI): one night of delayed/restricted sleep from 3-7am followed by 8 weeks of evening BWL for 60 min/day within 90 min of bedtime. We tested 17 P-M participants, 9 normal control-NC and 8 depressed-DP (by DSM-5 criteria) at home. Clinicians assessed mood by structured interviews and subjective mood ratings. Participants wore actigraphs to measure sleep and activity, and collected overnight urine samples for the melatonin metabolite, 6-sulfatoxymelatonin (6-SMT), before, during and after interventions.

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Results

Baseline depressed mood correlated with delayed 6-SMT offset time (cessation of melatonin metabolite (6-SMT) secretion) ($r = +.733$, $p=.038$). After PAI vs PDI, 6-SMT Offset (start of melatonin and 6-SMT decrease) advanced significantly in DPs (Mean $\pm$ SD = 2 h 15 min $\pm$ 12 min, $p=.042$); advance in 6-SMT acrophase (time of maximum melatonin and 6-SMT secretion) correlated positively with mood improvement ($r = +.978$, $p=.001$). Mood improved (+70%, $p=.007$) by both 2 and 8 weeks.

Conclusions

These preliminary findings reveal significantly phase-delayed melatonin rhythms in DP vs NC P-M women. Phase-advancing melatonin rhythms improves mood in association with melatonin advance. Thus, sleep and light interventions may potentially offer safe, rapid, non-pharmaceutical, well-tolerated, affordable home treatments for P-M depression.

Keywords: menopause, depression, sleep, light, melatonin, chronobiology

Biography

Barbara L. Parry, M.D. is Professor of Psychiatry at the University of California, San Diego (UCSD) where she has served as Director of the Women's Mood Disorders Clinic of the UCSD Outpatient Psychiatric Services, Director of the Women's Mental Health Clinic at the San Diego Veterans Administration Healthcare Center and Associate Director of the Medical Student Clerkship in Psychiatry. Before joining the faculty at UCSD in 1985, she did a research fellowship in Clinical Psychobiology at the National Institute of Mental Health in Bethesda, Maryland. She completed a residency in Psychiatry and an internship in Internal Medicine at the University of California, Los Angeles. Her clinical research focus is the chronobiology of mood disorders specific to women: premenstrual, pregnancy/postpartum and menopausal depression.

She conducts sleep, light, melatonin and other hormonal studies with the aim of developing non-pharmacological approaches to treatment. Her work is supported by NIH funding, she has authored or co-authored over 280 publications and served on NIH study sections, Data and Safety Monitoring Boards and the editorial boards of the American Journal of Psychiatry, the Journal of Biological Rhythms, the International Journal of Endocrinology and Equilibria, the Journal for Postpartum Psychiatric Illness Research.