The study of the human body clock has made tremendous strides in the past few years since the discovery in 2003 of the actual mechanism in the mammalian eye that regulates the production of the sleep hormone melatonin. This review summarizes some of the landmark developments presented at the 2006 Conference of The Society for Light Treatment and Biorhythm Research held in Quebec in July 2006.

**The First Electrophysiological Evidence of Biological Effect of Light Therapy on Retinal Function in Patients with Seasonal Affective Disorder (SAD)**

Lavioie, Bouchard et al. University Laval Robert-Giffard, Quebec and others.

**Background:** The aetiology of SAD is unknown, but there is consensus that SAD patients could be more vulnerable to the natural decrease in light exposure in autumn/winter.

**Methods:** 22 patients with SAD and 16 controls were submitted to a 4 week trial of Light Therapy (LT) and Electroretinogram (ERG) recordings obtained to measure retinal sensitivity and maximum voltage Vmax during light saturation.

**Results:** Cone and rod Vmax readings were significantly lower in SAD patients but a normalization was observed after 4 weeks of LT.

**Conclusion:** This is the first objective evidence of a cone dysfunction in SAD patients. The anomaly in cones was more important than that also present in rods. Both were corrected by 4 weeks of LT and this is the first evidence of a biological effect of LT. Although the origin of the retinal dysfunction is unclear ERG, appears to be a good tool to investigate SAD and the mechanism of LT.

**Stimulatory Effect of Bright Light on Sex Hormones and Ovulation in Humans**

Danilenko, Samoilova. Inst of Internal Medicine; Regional Oncological Hospital, Novosibirsk, Russia

**Objectives:** To confirm studies indicating a stimulatory effect of bright light on sex hormones and ovulation in humans.

**Methods:** 22 women with baseline menstrual cycle length of 28.1 - 37.8 days and without clinically evident endocrine abnormalities completed a study for two menstrual cycles separated by an off-protocol episode of at least one cycle. Bright light was compared to a dim light placebo. Blood sampling tested daily hormone levels and ovulation was examined using ultrasound.

**Results:** Prolactin, LH, FSH concentrations and follicle size were significantly increased after bright vs dim light. The number of ovulatory cycles was higher with bright vs dim light.

**Conclusions:** Morning bright light therapy administered in the follicular phase stimulates the secretion of hypophyseal sex hormones, ovary follicle growth and the occurrence of ovulation in women with slightly lengthened menstrual cycles. Study sponsored by Outside In®

**Atypical Symptoms and Diagnosis Predict Treatment Response to Light and Fluoxetine**

Lam, Ernst, Michalak et al. Universities Of British Columbia, Toronto, Manitoba, Dalhousie and McGill.

**Objective:** To determine predictors of treatment response in relation to specific symptoms and the presence or absence of atypical depression for patients with SAD.

**Methods:** 96 patients with a DSM-IV diagnosis of major depressive disorder, seasonal pattern, were recruited from 4 centres. In a double-blind, randomised controlled trial patients were assigned to 8 weeks of treatment with LT and a placebo capsule or fluoxetine (20mg/d) with placebo light.

**Outcome measures included the 24 Item Hamilton Depression Rating Scale.**

**Results:** No significant differences were observed in outcome between light and fluoxetine. Carbohydrate craving, increased eating and weight gain were symptom predictors of response to both light and fluoxetine. 40 of the patients met criteria for atypical depression and this was a predictor of treatment response. Those with atypical depression showed faster response than patients without an atypical specifier.

**Conclusion:** Patients with SAD who had atypical depression responded better to treatment than SAD patients without an atypical diagnosis, regardless of whether they received LT or fluoxetine. The findings highlight the importance of appetite and eating symptoms in the prediction of response to treatment in SAD.

**First Evidence that Wearing Blue-Blockers after the Night Shift Improves Daytime Sleep Efficiency**

Sasseville, Charron, Hébert, Université Laval Robert-Giffard, Quebec City

**Objectives:** Night shift workers complain of sleepiness at night and disturbed sleep during the day because of circadian rhythm disruption. Wearing dark glasses raises safety concerns. Orange tinted (blue-blocker) glasses offer a potential solution. They are designed to filter out blue-green light 400-540nm but leave sufficient light in the yellow-red spectrum to be safe for driving.

**Methods:** 8 permanent night shift workers in a postal distribution centre completed the study over 4 weeks. Their activity and exposure to light were monitored using an Actiwatch-L. For the first 2 baseline weeks they wore no blue-blocker glasses.

**Results:** Time in bed and light exposure (intensity and duration) were not different between the test periods, but the workers slept on average 31 additional minutes per day during the experimental weeks and their sleep efficiency increased by 1.95%

**Conclusions:** Blue-blockers seem to improve the actual duration of time spent asleep which may well improve the quality of life of the night shift worker.

**Effect of Bright Light on Psychomotor Performance during Night Shifts in Police Officers**

Tremblay, Waddington-Lamont, Bourdouxe and Boivin, McGill University, Montreal

**Objectives:** To look at how phototherapy (LT) affects vigilance levels when working night shifts.

**Methods:** 8 Police Officers working on rotated shifts were studied in the field over 7 consecutive night shifts. The test group used a portable light source (The Litebook) which may well improve the quality of life of the night shift worker.

**Results:** The LT group showed a significantly faster average reaction time than the control group. The subjects in the LT group had very similar vigilance scores at the beginning and end of their shift but the control group showed much lower vigilance (longer reaction times) at the end of their night shifts.

**Conclusions:** Participants exposed to bright light are more vigilant during their night shifts.
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