

Decreasing social jetlag with blue light

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To elucidate the changes in the timing of sleep and waking in different chronotypes (e.g. *owls* vs. *larks*) with at least 2 hours of social jetlag exposed to short wavelength (blue) light in the mornings upon awakening using Philips goLITE blu...

Ethical review	Not approved
Status	Will not start
Health condition type	Other condition
Study type	Interventional

Summary

ID

NL-OMON41014

Source

ToetsingOnline

Brief title

Social jetlag blue

Condition

- Other condition

Synonym

sleep deprivation, sleep loss

Health condition

sleep deprivation

Research involving

Human

Sponsors and support

Primary sponsor: Rijksuniversiteit Groningen

Source(s) of monetary or material Support: STW

Intervention

Keyword: blue light, sleep

Outcome measures

Primary outcome

Sleep timing and sleep quantity from sleep diaries and MCTQ.

Secondary outcome

Sleep timing and sleep quantity and light exposure profiles from actimetry.

Study description

Background summary

Many physiological processes are rhythmic and differ between people, for example our sleep-wake times or daily levels of alertness. An internal biological clock regulates these rhythms and the daily light/dark cycle is essential for ensuring that our body clock is synchronised to the 24-hour day. However, 80% of the population must use an alarm clock to awaken on workdays. By definition these people are chronically sleep deprived. From controlled laboratory studies, there is ample evidence showing the detrimental effects of sleep deprivation on health and performance, with consequences that would be catastrophic in real life, especially in shift-work occupations. This problem especially affects later chronotypes (with a later phase of entrainment), which primarily show an increased risk of chronic sleep deprivation, a phenomenon that has also been coined social jetlag. Chronotype (e.g. *owls* vs. *larks*) is assessed via the Munich Chronotype Questionnaire based on calculating the mid-point of sleep on free days (MSF) and workdays (MSW), with the MSF being corrected for sleep deficit accumulated across the workweek (MSF sleep corrected, MSFsc). Social jetlag is quantified as the difference between MSF and MSW, and is a marker for chronic physiological stress resulting from a mismatch between social and environmental/biological time. Having social jetlag, thereby, simply infers that one lives in a given time zone but works *in* a time zone further east (comparable to jetlag from traveling but without the actual travelling). This major societal problem can be greatly improved with a better understanding of the variety of responses of the human biological clock to the timing and intensity of both light exposure and light avoidance *especially in respect to short wavelength light which is most important to synchronise our internal clock. Previous studies from our group (METC2010/127 and METc 2011/056) have shown the potential of controlled morning blue light

exposure to advance the circadian phase of melatonin significantly. These studies tested small numbers of participants and argued in favor of future studies with larger sample sizes. Therefore, we aim to study more individuals to guarantee sufficient statistical power and additionally assess objective sleep timing through actigraphy measures.

Study objective

To elucidate the changes in the timing of sleep and waking in different chronotypes (e.g. *owls* vs. *larks*) with at least 2 hours of social jetlag exposed to short wavelength (blue) light in the mornings upon awakening using Philips goLITE blu devices.

Study design

Interventional field study; We will provide 100 participants (with a social jetlag of at least 2 hours) with Philips goLITE blu devices (as used in METC2010/127 and METc 2011/056) for an exposure to short wavelength light of 30 minutes in the morning across 14 days. 14 days before that (Baseline) and during the 14 days of using the goLITE blu, participants will complete sleep diaries and will wear actiwatches to assess sleep timing. In the analysis we compare the 14 days intervention period with a 14 days baseline period.

Intervention

Short wavelength light exposure via Philips* goLITE blu devices (appendix D1a and D2b) for 30 minutes in the mornings upon awakening for 14 days (except free days). In addition, participants will fill out a daily sleep log and wear an actiwatch (appendix D2a). At study start, participants will complete the Munich Chronotype Questionnaire (MCTQ).

Study burden and risks

We do not expect adverse events from participating in our study, based on our experience with comparable protocols (METC2010/127 and METc 2011/056). The only intervention is to sit for 15 minutes in front of a Philips goLITE blue device at 50 cm distance in the morning only on workdays and not on free days. All measurements will be performed at the participants* home and participants will throughout the study follow their normal daily routines and will not be instructed to follow pre-defined sleep times. The participants may benefit from the treatment with improvements in sleep quality, a reduction in daytime sleepiness and increased performance during the day. We do not expect any negative effects on these parameters from participating in our study.

Contacts

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Trial sites

Listed location countries

Netherlands

Eligibility criteria

Age

Adults (18-64 years)

Elderly (65 years and older)

Inclusion criteria

Healthy men and women between 18 and 45 years of age

Social jetlag \leq difference between mid-sleep on workdays and days off of minimum 2 hours

Written informed consent

Exclusion criteria

Two or more time zones crossed 1 month before study participation

Shift-work during 5 years prior to participation

Recent eye surgery (last year), glaucoma or other eye disease

History of chronic diseases, and/or use of chronic medication for 3 months or longer before study participation

Study design

Design

Study type: Interventional

Masking: Open (masking not used)

Control: Uncontrolled

Primary purpose: Other

Recruitment

NL

Recruitment status: Will not start

Enrollment: 100

Type: Anticipated

Ethics review

Not approved

Date: 13-11-2014

Application type: First submission

Review commission: METC Universitair Medisch Centrum Groningen (Groningen)

Study registrations

Followed up by the following (possibly more current) registration

No registrations found.

Other (possibly less up-to-date) registrations in this register

No registrations found.

In other registers

Register

CCMO

ID

NL47866.042.14