

Biologic Rhythms Are Key in Assessing Sleep

Aligning circadian rhythms can maximize patients' performance in workplace, on road.

BY HEIDI SPLETE
Senior Writer

ARLINGTON, VA. — Approximately 40 million Americans are affected by sleep disorders, and more than 100,000 motor vehicle accidents per year are sleep related, Teodor Postolache, M.D., said at the annual conference of the Academy of Organizational and Occupational Psychiatry.

An understanding of the biologic rhythms that are associated with disruptive sleep gives psychiatrists additional perspectives on occupational problems.

Inadequate sleep, for example, could trigger a manic episode in a bipolar disorder patient, which could lead to a confrontation at work and the loss of a job, said Dr. Postolache of the University of Maryland, Baltimore.

Biologic rhythms are based on the movement of the earth and sun. They are internally generated—they occur in anticipation of environmental conditions—and circadian rhythms are the biologic rhythms based on a 24-hour cycle, explained Dr. Postolache, who specializes in consulting with travelers and athletes about aligning circadian rhythms to maximize physical and mental performance on arrival.

"One of the major roles of the circadian system is to consolidate periods of wakefulness and sleep," as opposed to sleeping and waking several times during the day, he said. As people become sleepier, the circadian system sends signals to maintain alertness.

The circadian system raises the threshold for sleep in the evening, when sleepiness is at a maximum, and lowers that threshold in the early morning hours.

However, biologic rhythms vary with the individual, and laboratory research has shown that individual biologic rhythms impact cognitive performance. Psychiatrists—especially occupational psychiatrists—should keep this in mind.

Some people are "short sleepers" whose cognition does not improve if they sleep more than 7 or 8 hours, while others are "long sleepers" who truly need 10 hours of sleep to function at their best, Dr. Postolache said. Strategies that are aimed at helping sleep-disturbed patients get in tune with their biologic rhythms include taking naps and using light boxes and melatonin.

Naps

A 1-hour nap has been shown to pay

back as much as 4 hours of sleep debt. As a result, naps should be seen as a drug-free intervention for sleepiness, and certain conditions make them more effective.

Silence and darkness are key for quality naps, as is elevation of the feet, and the hands and feet should be comfortably warm. For some people, soothing music facilitates a nap, according to Dr. Postolache.

One caveat, however, is a "terrible drop in vigilance" immediately following a nap, he said. Known as sleep inertia, this period lasts an average of 15-20 minutes, but can last up to 2 hours in rare cases.

In fact, studies have shown that hospital residents are prone to making major mistakes during the first 15-20 minutes after a nap.

From an occupational standpoint, those people who take naps at work should be given simple tasks to do when they first awaken.

"Those 20 minutes after waking up should not be a time when someone should be required to make major life or business decisions," Dr. Postolache said.

Light boxes

Available in various forms and sizes, they help travelers shift their biologic rhythms to function at their best. Light boxes also may ease the discomfort of shift workers who are changing from a night shift to a day shift.

Melatonin

It is secreted in the dark, promotes sleepiness, and has been used to measure circadian rhythms. An onset of melatonin secretion occurs in the evening, followed by a rapid rise and then a plateau during the night.

The duration of melatonin secretion lengthens when the nights are long and shrinks when nights are short, he said.

Evidence for melatonin as a sleep agent is weak, but some evidence supports its use to reduce jet lag. A Cochrane Review (Cochrane Database Syst. Rev. 2002;2:CD001520) suggested that melatonin can relieve jet lag in people with a history of jet lag who are flying east (CLINICAL PSYCHIATRY NEWS, October 2004, p. 63).

Side effects of melatonin include drowsiness, decreased attention, GI symptoms, and possible antagonistic steroid effects, and it should be used on an as-needed basis, Dr. Postolache noted. ■



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DR. POSTOLACHE

Caffeine and Naps Only Slightly Helpful to Night Shift Workers

BY NICHOLAS MULCAHY
Contributing Writer

PHILADELPHIA — The combination of caffeine and evening naps has only modest positive effects on performance and subjective sleepiness of night shift workers, Paula Schweitzer, Ph.D., reported at the annual meeting of the Associated Professional Sleep Societies.

In a rare field study of night shift workers, 39 participants (28 males; mean age 33 years) completed a 4-consecutive-night crossover study comparing two conditions: an evening nap prior to the night shift on the first 2 nights plus caffeine 300 mg on all 4 nights and placebo without napping on all 4 nights.

Three times during each night (start of shift, midway, and end of shift), participants completed a 15-minute psychomotor vigilance task (PVT) using a handheld PVT electronic device that measured the subject's reaction times to tasks. The study subjects also completed subjective sleepiness and mood tests three times a night, said Dr. Schweitzer, associate director of the Sleep Medicine and Research Center at St. Luke's Hospital, St. Louis.

RT10, or the reaction time of the slowest 10% of the PVT responses, worsened across nights 1-4 for both the nap/caffeine treatment group and the placebo group.

"Alertness and performance did not im-

prove across successive night shifts—as has been found in some laboratory studies. People are not getting used to things [on the night shift]," Dr. Schweitzer said.

But some evidence indicated that the caffeine and naps did help somewhat.

Only the placebo group had a worsening of RT10 from shift start to shift end. Additionally, at shift end, the placebo group's RT10 was worse than that of the caffeine/nap treatment group.

The study also evaluated PVT lapses, which are unacceptably long delays in PVT reaction time. Again, the nap/caffeine group outperformed the placebo group. PVT lapse frequency increased from shift start to end for the placebo group, with no change for the treatment group. But both the placebo and treatment groups had an increase in lapse frequency across nights 1-4, which, in effect, was further proof of Dr. Schweitzer's observation that workers are not getting accustomed to night shift work.

Subjective sleepiness as measured by the Karolinska Sleepiness Scale also indicated some benefit of the caffeine and naps. The placebo group showed increased sleepiness at shift end, but the treatment group did not. There was no change in sleepiness ratings across nights 1-4, Dr. Schweitzer said.

Actigraph-estimated total sleep time for daytime sleep did not differ between the two groups. ■

Modafinil Still Effective for Sleep Apnea After 17 Weeks of Therapy

BY NICHOLAS MULCAHY
Contributing Writer

PHILADELPHIA — Modafinil in patients with obstructive sleep apnea and excessive daytime sleepiness despite positive airway pressure therapy was effective in improving wakefulness for at least 17 weeks in a small study presented at the annual meeting of the Associated Professional Sleep Societies.

Previous studies of the wakefulness drug and obstructive sleep apnea (OSA) had been limited to 12 weeks, Juan Moralejo, M.D., reported.

"In our study population, modafinil was more likely to be effective in the elderly and those with high Epworth Sleepiness Scale scores at the time of diagnosis" of daytime sleepiness, said Dr. Moralejo, a pulmonary medicine fellow at Graduate Hospital, Philadelphia.

The study sample consisted of 22 patients (13 males and 9 females), mean age 53.9 years. Of the 18 patients receiving "conventional treatment," 9 were using continuous positive airway pressure, 8 were using bilevel positive airway pressure, and 1 was using a dental device. At the time of the survey, four patients were not using any conventional treatment for OSA.

The mean Epworth Sleepiness Scale score was 15.9 at diagnosis, 13.6 after treatment with conventional modalities, and 8.9 after treatment with modafinil (Provigil). A lower Ep-

worth score is indicative of improved wakefulness, and reduction of 4 points is considered a response to treatment. No statistical difference was found between the Epworth scores before and after conventional treatment, but the change after modafinil treatment was significant, Dr. Moralejo said.

The improvement in Epworth Sleepiness Scale score was similar whether patients were on modafinil for more than or less than 12 weeks. The average duration of treatment was 17 weeks (range 1-40).

On univariate analysis, factors associated with response to modafinil were higher Epworth Sleepiness Scale score at diagnosis, higher Epworth score while on conventional therapy, and male gender, said Dr. Moralejo, who has no affiliation with Cephalon, maker of Provigil. But on multivariate analysis, a high Epworth score at diagnosis of OSA and increasing age correlated best with response to modafinil.

The average dosage of modafinil was 227.3 mg once daily (range 100-800). No significant side effects were documented.

Epworth Sleepiness Scale scores at the diagnosis of OSA and after treatment with conventional modalities were obtained from the patients' records. A telephone survey was conducted and included questions about patients' demographics, modafinil treatment, and type of ongoing conventional treatment for OSA as well as patient compliance with this treatment. ■