Acta neurol. belg., 2002, **102**, 186-187

Case reports

More sleep cycles in the mid-luteal phase of a healthy control

O. Le Bon[1], K. Yonkers[2] and R. Armitage[3]

[1]Sleep ResearchUnit Center, CHU Brugmann, Université Libre de Bruxelles, Brussels, Belgium
[2]Dept of Psychiatry, Yale University, New Haven, Connecticut, USA
[3]Sleep Study Unit, University of Texas Southwestern Medical Center at Dallas, Texas, USA

Case Report

A 28 year old healthy female was reported (Armitage and Yonkers, 1994) to have more Rapid Eye Movement Sleep (REMS) and a shorter REMS Latency (RL) in her mid-luteal phase than in her follicular phase. This was established by two polysomnograms and progesterone levels at the two study points. The psychiatric profile was found to include no major personal or familial psychopathy and the depression scores were very low at the two measurements.

Recently, the link between RL and the number of sleep cycles per night, or Sleep Cycle Frequency (SCF), first described in 1985, was confirmed in a large group of healthy controls (Le Bon *et al*., 2001). A link between the SCF and REMS was also demonstrated in the same group of subjects (Le Bon *et al*., 2002). Interestingly, in both cases, the links were stronger in the male subgroup than on the whole, so that some factor related to the menstrual cycle was suspected.

As part of a program designed to evaluate the interest of SCF as an alternate measure of REMS and RL, we revisited the reported case to observe the prediction that more sleep cycles would be present when REMS was longer and RL, shorter.

Further details on the methodology can be found in the original presentation (Armitage and Yonkers, 1994). Sleep cycles were defined using the classical "15 minutes" rule of maximum tolerated interrutions of REMS by NREMS or awakenings (Feinberg and Floyd, 1979).

Four cycles were found present on the two nights of the follicular phase. Respectively 5 and 6 sleep cycles were found on the two polysomnograms of the luteal phase. Total sleep duration was not a major issue, since Sleep Period Time was practically identical in average in both cases : 392 and 390 minutes.

Discussion

Our prediction that more sleep cycles would be present in the luteal phase was hence confirmed here. The present case is particularly interesting since the subject was her own control, whereas the links between SCF and REMS and RL were established comparing subjects, hence bearing the risk that idiosyncratic characteristics of REMS may have influenced the relationship.

The parallel observed here between RL and SCF should encourage the study of the latter as a potentially useful parameter in neuropsychiatry, where RL has been studied extensively as a marker for depression and was eventually found disappointing. It has been hypothesized (Le Bon *et al*., 2001) that RL may mostly reflect periods and frequencies of sleep cycles, of which the study could potentially prove to be of more diagnostic value. Indeed, more sleep cycles were encountered in depressive and dysthymic patients in a comparison with healthy controls (Merica *et al*., 1993). More sleep cycles in the luteal phase could thus perhaps reflect an increased sensitivity to dysphoric symptoms at that phase in patients with Pre-Menstrual Dysphoric Disorder (PMDD). However, the present case reported no complaints of PMDD, so that it can also be a normal characteristic accompanying the menstrual cycle.

In any case, the phase of the menstrual cycle is confirmed to be an important consideration in the timing of diagnostic evaluations of REMS-related parameters.

Two hypotheses can now be tested : (1) is there in average more sleep cycles in the luteal phase than in the follicular phase in healthy controls ? ; and (2) is there a difference in SCF between PMDD patients and controls at either phase of the menstrual cycle ?

In conclusion, a parallel was found here between an ultradian (sleep) and an infradian (menses) cycle in a healthy control, which invites further exploration of this relationship.

REFERENCES

Armitage R., Yonkers K. A. Case report : menstrual-related very short REM latency in a healthy normal control. *Sleep*, 1994 Jun, **17** (4) : 345-7.

LE BON O., STANER L., HOFFMANN G., KENTOS M., PELC I., LINKOWSKI P. Shorter REM latency associated with more sleep cycles of a shorter duration in healthy humans. *Psychiatry Res*., 2001 Oct 10, **104** (1) : 75-83.

LE BON O., STANER L., RIVELLI S. K., HOFFMANN G., PELC I., LINKOWSKI P. Correlations using the NREM-REM sleep cycle frequency in healthy humans support distinct regulation mechanisms for REM and NREM sleep. *J. Applied Physiology*, 2002, 93 : 141-146.

FEINBERG I., FLOYD T. C. Systematic trends across the night in human sleep cycles. *Psychophysiology*, 1979, **16** (3) : 283-291.

MERICA H., BLOIS R., BOVIER PH., GAILLARD J. M. New variables for defining sleep continuity. *Physiology and behavior*, 1993, **54** : 825-831.

O. LE BON,
CHU Brugmann
Sleep Research Unit
Somalcpe
B-1020 Bruxelles (Belgium).
E-mail : lebono@ulb.ac.be.