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EDITORIAL

A good sleep for a fresh mind in patients with acute traumatic brain injury

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Sleep is essential to restore body and brain functions. Animal and human data demonstrate in addition a fundamental role of sleep in memory consolidation and learning.[1–3] Accordingly, sleep loss and sleep disorders are associated with disturbances of memory, learning, and, more generally, cognitive function.[4,5]

During adulthood, we spend approximately a third of our lives asleep, and as life progresses, sleep develops age-dependent changes,[6] commonly accompanied by an increased frequency of sleep disorders. Of note, recent studies found a direct link between markers of neurodegeneration, sleep, and cognitive changes in patients with Alzheimer disease.[7]

This increasing evidence, linking sleep and brain function (or dysfunction) directly, justify the growing interest in the study of pathologic sleep changes in the course of neurologic disorders, including stroke and traumatic brain injury.[8,9] The assessment of the relationship between sleep and cognition in patients with brain damage may improve our understanding of the mechanisms involved in functional recovery, and may disclose potential new targets to promote it.

In line with this general hypothesis, Duclos et al.[10] recently studied patients with acute traumatic brain injury, and found a relationship between recovery of consciousness and reappearance of a normal sleep-wake cycle (as assessed by wrist actigraphy). More specifically, they found that patients who recovered the ability to follow commands, with appropriate verbalization and motor responses, also recovered a 24-hour sleep-wake cycle and consolidated nighttime sleep. Moreover, they found that both functions recover synchronously, suggesting the possibility of common underlying brain mechanisms. The results of this study are in line with other studies in which a correlation between the recovery of the sleep-wake cycle and reappearance of consciousness occurred in patients evolving from a vegetative into a minimally conscious state.[11] More generally, these results expand our understanding of the potential relationship between neuroplasticity processes underlying functional recovery after brain damage and normal sleep-wake functions.

A few limitations of this work deserve mention. Wrist actigraphy is a simple and inexpensive tool to assess the sleep-wake cycle.[12] Actigraphic measures correlate reasonably well with polysomnographic measurements of sleep and wakefulness in healthy persons and patients with sleep disorders.[12,13] However, there is no (good) validation for the use of actigraphy to assess sleep-wake functions in patients with brain damage, and in particular, with traumatic brain injury. Since actigraphy primarily assesses motor activity, changes in motor functions (and activation) represent important potential confounding factors when interpreting actigraphic data. The present study used the Rancho Los Amigos scale of cognitive functioning, a behavioral scale that is a valid clinical tool to evaluate the level of consciousness. However, even if the Rancho Los Amigos scale can be easily administered at bedside, and its simplicity in characterizing the level of recovery have resulted in common use, variability in scoring—for example, activity induced by different degrees of stimulation used by examiners when assessing patients—can affect reproducibility.[14] Finally, as indicated also by the authors, future investigations should take into account the role of environmental factors, such as hospital lighting and noise (but also medications, nonpharmacologic interventions, and comorbidities), as potential codeterminants of sleep-wake and of eventual cognitive recovery.

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DISCLOSURE

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