

Future Challenges in Nocturia: Relevance to Voiding Clock?

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Sleep is a naturally stereotypical behavioral state, characterized by reduced or absent consciousness and inactivity of all voluntary muscles. However, sleeping is not just an inactive state, but an essential activity for survival, such as for the repair and renewing of our bodies. The timing of the sleep cycle is controlled by a complex interaction between the circadian clock and a separate sleep-wake homeostatic process. This complex interaction is also affected by the aging process [1].

Even though the precise functions and mechanisms of sleep are only partially understood, recent evidence suggests that the primary mammalian circadian timing system, which is located in the suprachiasmatic nucleus (SCN) of the hypothalamus, resets itself every day in response to light signals. The SCN receives information from the eye and transfers it to the pineal gland, the endocrine gland that secretes melatonin, the “hormone of darkness”. Recent studies have found that melatonin has beneficial effects for the treatment of certain sleep disorders. Besides the SCN “master clock”, independent circadian clocks are also found in many organs, such as the esophagus, lung, liver, pancreas, spleen, thymus, skin, and kidney, which constitute the so-called peripheral oscillators [2,3]. The presence of a bladder clock and influence by a kidney clock remain to be elucidated.

Nocturia is a common storage symptom with a significantly negative impact on health-related quality of life in aging people [4]. Because the average age of people in developed countries is increasing, it is expected that nocturia will become more common in the future, because the prevalence of nocturia increases

with age. Although substantial efforts have been made to provide insights into the etiology of the disease and corresponding remedial actions, many unanswered questions remain about the bladder in terms of sleep.

The article by Cho et al. [5] in this issue of the journal will be recognized as a valuable landmark that lays the foundation for future research to shed some light on the circadian control of voiding function and dysfunction via the molecular clockwork. Through the International Neurourology Journal, we also hope to foster and reinforce the dialogue between basic researchers and health care providers.

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