A naturally short sleeper phenotype with a sleep need of less than 6 hours without negative impact on health or performance is rare. We present a case of an acquired short sleeper phenotype after third ventriculostomy. A 59-year-old patient suffering from chronic hydrocephalus reported an average of 7-8 h of nocturnal sleep. After surgical intervention, the patient noted a strikingly reduced sleep need of 4-5 h without consequent fatigue or excessive daytime sleepiness, but with good daytime performance and well-balanced mood. Short sleep per 24 hours was confirmed by actigraphy. Postoperative imaging revealed decreased pressure around the anterior third ventricle. The temporal link between development of a short sleeper phenotype and third ventriculostomy is striking. This might suggest that individual short sleep need is not only determined by genetics but can also be induced by external factors.

**Keywords:** Short sleeper, sleep regulation, ventriculostomy

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**DISCUSSION**

The phenotype of short sleepers is commonly described either as natural congenital state without impairment of health or performance status or as a habitual state with unfavorable subjective and objective health consequences. In comparison to...
long sleepers, short sleepers exhibit enhanced slow wave sleep activity without differences in homeostatic sleep regulatory mechanisms. Further, melatonin and cortisol levels as well as body temperature in short sleepers indicate a shorter biological duration of nocturnal sleep in contrast to long sleepers. Others found that a mutation in a transcriptional repressor (hDEC2-P385R) is correlated with short sleeper phenotype in humans and mice.3

To our knowledge, development of a short sleeper phenotype by external circumstances or a surgical intervention has not been described before. In this line, the timely association with third ventriculostomy in this clinical case is highly suggestive of a causal link. The alleviation of the preexisting condition of hydrocephalus might explain a reversion of symptomatic hypersomnia to normal sleep duration of 6 to 8 hours, but not to a sleep length less than 5 hours. Similarly, a hypomaniac psychiatric condition could be considered to transiently reduce sleep length. However, the very low sleep duration as well the long and stable course of both reduced sleep need and the persistent well-balanced mood favors the hypothesis of a causal link between the intervention and the short sleeper phenotype. Interestingly, a hypomaniac phenotype was found in naturally short sleepers compared to respective control subjects in matched-control study.6

Still, the underlying mechanisms remain highly speculative. Beyond presumably lowered overall supratentorial brain pressure, thalamic and hypothalamic structures near the intervention site might be responsible for the changed regulation of sleep homeostasis and circadian regulation. Due to their exposed location and the proximity to the third ventricle, decompression of the wake-promoting histaminergic neurons in the tuberomammillary nucleus might be involved or alternatively altered expression of genes regulating circadian rhythm and sleep homeostasis. Further studies in animal models and

Figure 1—Cranial MRI imaging before and after the third ventriculostomy.
human cohorts are warranted to validate the correlation of third ventriculostomy with a short sleeper phenotype.

REFERENCES


DISCLOSURE STATEMENT

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