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Letter to the editor

## Sleep and body mass index in patients with bipolar disorder

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*To the Editor,*

Boudebesse et al. recently reported a positive association between body mass index (BMI) and sleep disturbance in patients with bipolar disorder (BD) by using wrist accelerometer, named Actiwatch (AW-7 CamNtech®), and subjective assessment of sleep, named Pittsburgh Sleep Quality Index (PSQI) [1]. In patients with BD, higher BMI was significantly correlated with lower sleep efficiency, shorter total sleep time, longer sleep onset latency, higher fragmentation index, higher inter-day variability and higher PSQI total score in their study. The authors know the limitation in small number of samples and cross-sectional study design to determine the causality of the association. I have two concerns on their study.

First, they used Actiwatch to determine several objective sleep parameters, and this device prepares some sensitivity threshold settings using the Actiwatch software (Actiwatch Activity & Sleep Analysis Ltd CamNtech® 7.28). I suppose that the authors selected "average" sensitivity threshold by default from the information of the past report [2]. But there are reports that the lower sensitivity threshold (20 counts per minute), instead of "average" threshold, present higher agreement with gold standards from sleep polysomnography [4–6]. The lower sensitivity threshold leads to the increase of awakening, and each sleep parameter is directly affected by this setting. There is a difference between brain activity and physical movement during sleep, and validation study by sleep polysomnography as a gold standard in some patients with BD is recommended to determine the appropriate sensitivity threshold of Actiwatch.

Second, Geoffroy et al. recently reported a case-control study to know the predictive ability of several parameters including sleep for patients with BD [3]. They concluded that sleep parameters and their variability could predict patients with euthymic BD satisfactory (89%), when age, gender, daytime sleepiness, mood symptoms, BMI, and risk of sleep apnea were adjusted. I suppose that the subjects are the same with patients and controls in report by Boudebesse et al., and I have a doubt on the application of backward stepwise logistic regression analysis to data with small number of events (26 patients with BD). The wide range of 95% confidence interval of odds ratio partly reflects the lack of statistical power.

Furthermore, Boudebesse et al. reported that there was a significant negative association between BMI and total sleep time in patients with BD, and this trend was also observed in healthy controls (Rho = −0.35, $P = 0.06$). There is a complicated mechanism on the relationship between obesity and BD, suggesting a need to investigate the bidirectional relationships between them [7]. BD is closely related to sleep disturbance and frequently reflect physical appearance such as BMI. To specify the causality of the association, longitudinal research is necessary to confirm the relationship among BD, BMI and sleep disturbances.

### Disclosure of interest

The author declares that he has no conflicts of interest concerning this article.

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