Sleep analysis with Somno-Art Software as compared to Somnolyzer, a validated computer-assisted sleep classification, in apneic patients and healthy controls - a valid alternative?

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INTRODUCTION

It was shown that the analysis of heart rate and body movements during sleep, using an integrated system (Somno-Art Software) provides similar results to the evaluation of sleep architecture performed with polysomnography (PSG) in healthy subjects.

The aim of the current analysis was to confirm that this approach could discriminate sleep modulations observed in obstructive sleep apnea (OSA) patients as compared to healthy participants likewise.

METHODS

Full PSG and recordings of heart rate and body movements in 77 nights, 40 from healthy participants and 37 from OSA patients were analyzed. PSG data were processed according to the American Academy of Sleep Medicine (AASM) rules using a validated scoring solution (Somnolyzer). For sleep analysis based on heart rate and body movements, the Somno-Art algorithm was used. The extracted sleep parameters were compared between healthy controls and OSA patients using unpaired Mann-Whitney U test for each scoring method.

RESULTS

Both approaches characterized similarly the specific sleep modulation due to apnea pathology: total sleep time, sleep efficiency and REM sleep duration decreased significantly in OSA patients as compared to healthy controls. The differences observed for wake after sleep onset (WASO), sleep onset latency and REM sleep latency in OSA patients were revealed by both methods likewise.

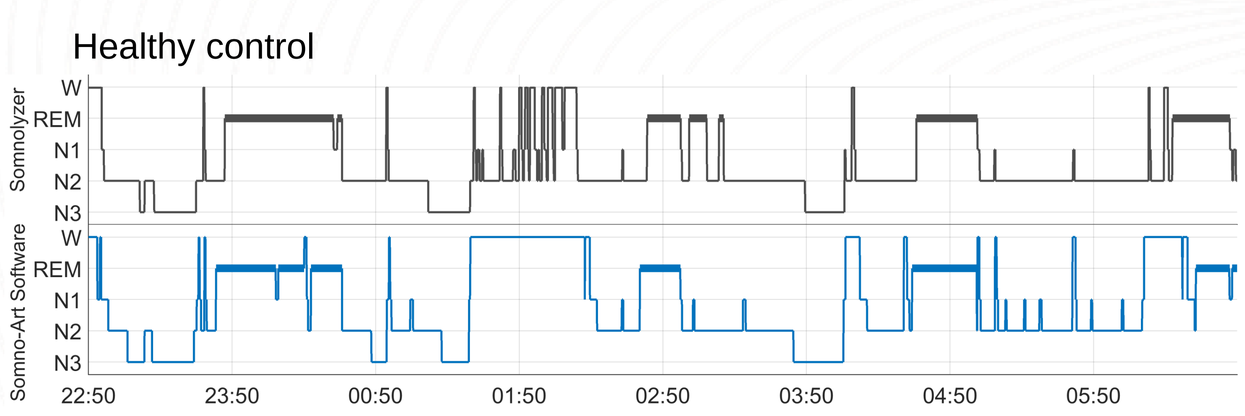

Figure 1: Comparative hypnograms obtained from Somnolyzer (grey) and Somno-Art Software (blue) for a healthy control and an apneic patient.
W: Wake, REM: REM sleep, N1-N3: Sleep stage 1-3.

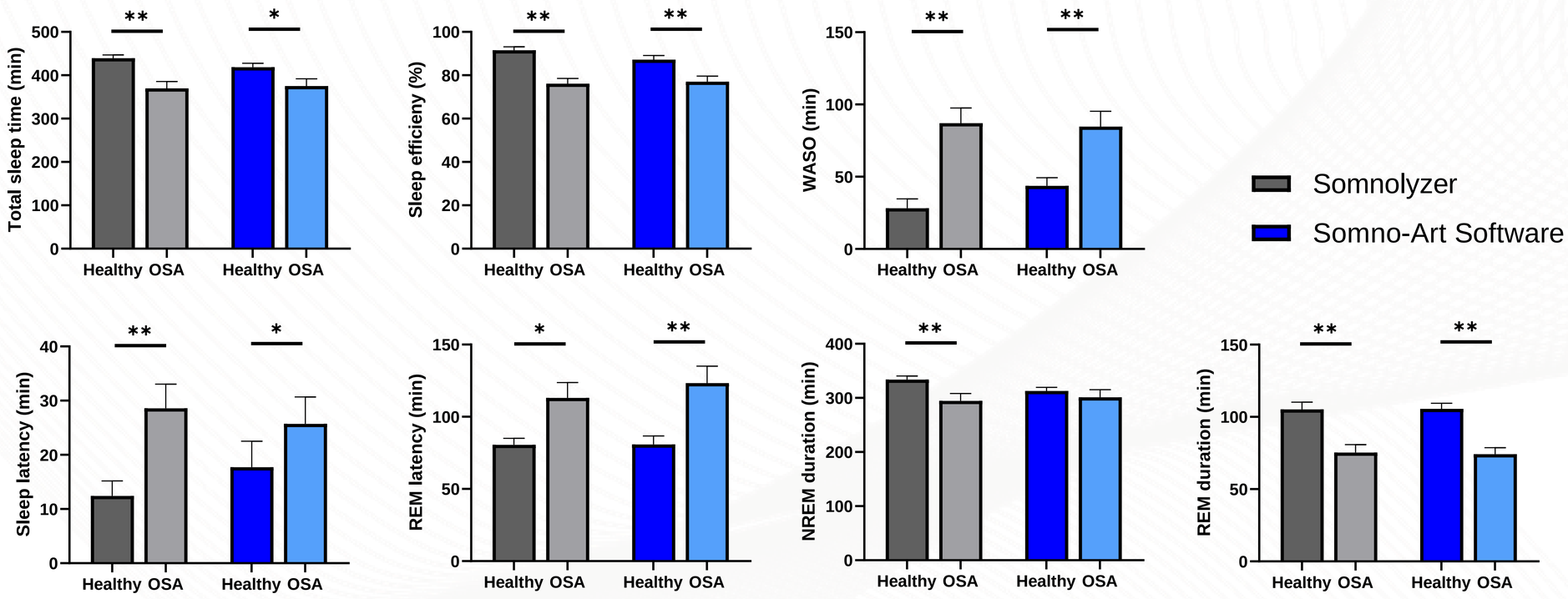

*Figure 2: Comparison of sleep variables between healthy controls and patients with obstructive sleep apnea (OSA) for PSG (Somnolyzer: grey) and sleep analysis based on heart rate and body movement (Somno-Art Software: blue). *: p<0.05, **: p<0.01, WASO: Wake after sleep onset.*

CONCLUSION

In conclusion, this work provides evidence that Somno-Art Software, a new sleep monitoring system using integrated analysis of heart rate and body movement, delivers promising results with respect to the calculated sleep parameters. In a between-group design the results obtained are similar to those of standard PSG.
Thus, Somno-Art Software is a new sleep scoring solution which proposes an applicable alternative to PSG in OSA patients and healthy controls.

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