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Title: Changes of complexity of pulse wave signal after elimination of sleep apnea

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Body: Introduction: Multiscale entropy (MSE) is a tool to describe complexity of the signal in different time scales. We use MSE to describe complexity of pulse wave amplitude (PWA) and pulse rate (PR) in patients suffering from OSAS. Material and methods: 30 patients undergoing diagnostic and CPAP titration were recruited (25 males, mean age 53.2±13.7 yrs, body mass index 29.8±6.8 kg/m²). During both nights patients were monitored using polygraphy (Embletta, Medcare, Iceland) and pulse wave (oximetry probe) signal was registered. Signal was processed by self-developed software to obtain PWA and PR signals further analyzed using MSE (r=0.15, m=2, scale=1.20). For PWA analysis 3 data sets affected with signal ceiling were removed. Results: The results of MSE analysis are presented on the graphs.

Conclusions: Eliminating of breathing events affects the complexity of PWA and PR signals especially in higher MSE scales which could be interpreted as effect of eliminating arousal related effects. PWA is more sensitive on eliminating events in scale 1 and no difference in PR complexity suggests possibility of reflection of overall cardiovascular status unrelated strictly to OSA.