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Title: Impact of continuous, non-invasive blood pressure (BP) measurement on sleep quality during polysomnography (PSG)

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Body: Introduction: Obstructive sleep apnea (OSA) is generally considered an etiologic factor in the development of hypertension (HT). Recent findings, demonstrating that renal sympathetic denervation could also reduce OSA severity, provoke new questions on the interaction of HT and OSA. Portapres continuous non-invasive blood pressure measurement during PSG might be a powerful tool for future research to better understand these mechanisms. However, the effect of overnight Portapres BP monitoring itself on sleep is unclear. Aims: To analyze the impact of Portapres BP measurement on sleep quality during PSG. Methods: 40 individual patients with either treated or newly diagnosed untreated sleep apnoea syndrome were recruited. They underwent one overnight PSG randomly with or without simultaneous Portapres BP measurement. Results: 20 PSG recordings with additional Portapres monitoring and 20 gender and treatment matched control PSGs were investigated for comparisons. In the Portapres and the control group mean age was 58 and 56 years, 55 and 60 % were males, 75 and 60 % had predominantly OSA, 50 and 50 % had CPAP treatment, mean apnea-hypopnea-index was 14.1 and 21.0, mean arousal index 21.4 and 24.7, mean total sleep time 5.2 and 5.4 hours, mean sleep efficiency 75.2 and 73.9 %, mean sleep onset latency 20 and 21 minutes, mean REM-sleep 16 and 15 % and mean slow-wave sleep was 8.8 and 11.5 %, respectively. Conclusions: The results of this pre-study suggest that Portapres BP measurement during overnight PSG does not have a clinically relevant impact on sleep quality and might therefore be a good diagnostic tool for future research on HT and BP changes in sleep apnea.