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Title: The method for diagnosis matters in sleep apnea. A systematic analysis of polygraphy and polysomnography data in the European Sleep Apnea Database (ESADA)

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Body: In the ESADA study, each of the 23 participating centers used its own routine clinical and diagnostic procedures for OSA detection. Altogether, data from 8228 patients with suspected OSA (M or F, 18–80 yrs) were analysed in order to compare results obtained by polygraphy (PG) (n= 5032) or polysomnography (PSG) (n=3196). The AASM 2007 criteria have been used for visual scoring of apnoea/hypopnoea and in addition in a PSG study, an event with $\leq 50\%$ flow reduction, associated with arousal was also classified as hypopnoea (Eur Respir J 2011; 38: 635–642). AHI was higher by PSG (29.9 ± 26 hr⁻¹) than by PG (22.3 ± 23 hr⁻¹) ($p < 0.001$). 66% of the patients had an AHI > 15 by PSG whereas only 50% of patients were above this limit by PG ($p < 0.001$). Although analyzed time (7.4 ± 0.9 hr) by PG was higher than total sleep time (6.4 ± 1.3 hr) by PSG ($p < 0.0001$), oxygen desaturation index (ODI) ($\geq 4\%$) was only marginally different: 21 ± 24 hr⁻¹ by PSG and 19 ± 22 hr⁻¹ by PG. Furthermore the difference between the AHI and ODI scores was higher by PSG (8.6 ± 15.7) than by PG (1.1 ± 10) ($p < 0.0001$). The average number of events per recording was similar by PG (186 ± 183) and by PSG (184 ± 189) (NS) which rules out a significant time dilution effect to explain the higher AHI by PSG compared with PG. In summary, the AHI is underestimated by PG leading to a lower rate of patients suffering from significant OSA than by PSG. This discrepancy is likely to relate to the scoring of hypopnea by arousal rather than the result of the time dilution effect. supported by enabling grants from RESMED and PHILIPS RESPIRONICS.