Screening of obstructive sleep apnea syndrome by heart rate variability analysis.

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BACKGROUND
Enhanced nocturnal heart rate variability (HRV) has been evoked in sleep-related breathing disorders. However, its capacity to detect obstructive sleep apnea syndrome (OSAS) has not been systematically determined. Thus, we evaluated the discriminant power of HRV parameters in a first group of patients (G1) and validated their discriminant capacity in a second group (G2).

METHODS AND RESULTS
In G1, 39 of 91 patients (42.8%) were identified as diseased by polysomnography, as were 24 of 52 patients (46%) in G2. Time-domain HRV variables (SD of NN intervals [SDNN], mean of the standard deviations of all NN intervals for all consecutive 5-minute segments of the recording [SDNN index], square root of the mean of the sum of the squares of differences between adjacent normal RR intervals [r-MSSD], and SD of the averages of NN intervals in all 5-minute segments of the recording [SDANN]) were calculated for daytime and nighttime periods, as well as the differences between daytime and nighttime values (Delta[D/N]). Correlations between HRV variables and OSAS status were analyzed in G1 by use of receiver-operating characteristic (ROC) curves and logistic regression analysis. By ROC curve analysis, 7 variables were significantly associated with OSAS. After adjustment for other variables through multiple logistic regression analysis, Delta[D/N]SDNN index and Delta[D/N] r-MSSD remained significant independent predictors of OSAS, with ORs of 8.22 (95% CI, 3.16 to 21.4) and 2.86 (95% CI, 1.21 to 6.75), respectively. The classification and regression tree methodology demonstrated a sensitivity reaching 89.7% (95% CI, 73.7 to 97.7) with Delta[D/N] SDNN index and a specificity of 98.1% (95% CI, 86.4 to 100) with Delta[D/N] SDNN using appropriate thresholds. These thresholds, applied to G2, yielded a sensitivity of 83% using Delta[D/N] SDNN index and a specificity of 96.5% using Delta[D/N] SDNN.

CONCLUSIONS
Time-domain HRV analysis may represent an accurate and inexpensive screening tool in clinically suspected OSAS patients and may help focus resources on those at the highest risk.
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