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**Title:** OSAS severity is associated to decreased heart rate turbulence slope

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**Body:** Obstructive sleep apnea syndrome (OSAS) has been associated to impaired baroreflex sensitivity (BRS) which has recently been shown to be non-invasively assessed by heart rate turbulence (HRT) analysis. Although HRT seems to be better suited than traditional heart rate variability indexes for autonomic assessment in presence of respiratory and arrhythmic disorders, very few papers addressed its evaluation in OSAS. Aim of the study is to find out whether and to which extent HRT is associated to OSAS severity. HRT consists of sinus cycle length fluctuations following spontaneous isolated VPC composed by an early rate acceleration phase, namely turbulence onset (TO), and by a late deceleration phase, namely turbulence slope (TS). We studied HRT in polysomnographic recordings of 82 mild ( $5 < \text{AHI} < 15$ ), 74 moderate ( $16 < \text{AHI} < 30$ ) and 65 severe ( $\text{AHI} > 30$ ) OSAS pts. (age  $62 \pm 14$ , 71% males). Results showed that, while TO values did not significantly differ between mild ( $-0,78 \pm 1,50$ ), moderate ( $-0,89 \pm 1,78$ ) and severe ( $-0,70 \pm 1,28$ ) pts., TS significantly decreases (Kruskal-Wallis P value  $< 0.05$ ) from mild ( $3,27 \pm 2,7$ ) to moderate ( $2,6 \pm 2,6$ ) and severe ( $1,98 \pm 2,5$ ) pts., with a significant Dunn's multiple comparisons post test only between mild vs. severe OSAS pts. Data indicate that the main BRS alterations do not appear in the early HRT phase triggered by transient vagal inhibition, with  $\text{TO} < 0$  normal values in mild to severe pts., but during the slow one, due to the sympathetic hyperactivity affecting the heart rate recovery, with  $\text{TS} < 2.5$  abnormal values associated to increasing OSAS severity. These findings support the conclusion that HRT assessment could have a prognostic value related to the development of cardiovascular disease in OSAS.