Title: Correlation between heart rate variability indexes and aerobic physiological variables in patients with COPD

Body: Heart rate variability (HRV) has become an important clinical tool for assessing autonomic nervous system. HRV has the potential to provide additional valuable insight into physiological and pathological conditions. However, it is not known if HRV has correlation with aerobic physiological variables in patients with COPD. Therefore, this study aimed to correlate resting HRV indexes with aerobic physiological variables obtained in maximal exercise testing in patients with COPD. Thirteen patients with COPD (Age 65.6±7.4; BMI 27.5±4.4; FEV1% 50.4±15.5) performed a maximal exercise testing on a treadmill to determine maximal oxygen uptake (VO$_{2 \text{max}}$), intensity exercise corresponding to VO$_{2 \text{max}}$ (IVO$_{2 \text{max}}$) and ventilatory thresholds by O$_2$ and CO$_2$ equivalents (VT1 and VT2, respectively). For HRV analysis the heart rate was measured by a heart rate monitor (Polar Electro, S810i, Finland) with the volunteers at rest and HRV indexes were analyzed using linear methods in the time (rMSSD and SDNN) and frequency (LF, HF and LF/HF ratio) domain and nonlinear methods (SD1 and SD2). Shapiro-Wilk test was used to assess the normality of the data and the correlations between HRV indexes and physiological variables were verified by Pearson or Spearman test. The level of significance was set at 5%. There were correlations between SDNN and VT2(R=0.65), rMSSD and VT1 (R=0.56), VT2 and SD1 (R=0.56), SD2 and IVO$_{2 \text{max}}$ (R=0.55), SD2 and VT2 (R=0.66). We conclude that resting HRV indexes were correlated with aerobic physiological variables in patients with COPD, which suggests that this clinical tool can be used as a predictor of aerobic
performance in maximal exercise testing in these patients.