Abstract: P2550
The influence of tonic-clonic seizures on heart rate variability in patients with refractory epilepsy

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Background: Heart Rate Variability (HRV) is an increasing area of interest in patients with epilepsy. The effects of epilepsy on the autonomic control of the heart are not completely understood and that autonomic dysfunction has been implicated in some cases of Sudden Unexpected Death in Epilepsy (SUDEP).

Objective: To study the influence of generalized tonic-clonic seizures (GTCS) on HRV of patients with focal refractory epilepsy.

Method: We prospectively evaluated (January 2015 to July 2018) 121 patients admitted to our institution’s Epilepsy Monitoring Unit. All patients performed a 48-hour Holter recording. Patients who had GTCS during the recording were included and we selected the first GTCS as the index seizure. HRV (AVNN, SDNN, RMSSD, pNN50, and LF/HF) was evaluated by analyzing 5-min-ECG epochs during inter-ictal and post-ictal periods: baseline, pre-ictal (5 min before the GTCS seizure), post-ictal (5 min after the seizure), and late post-ictal (> 5 hours after the seizure). We compared HRV data from these patients with normative values for a healthy population (controlling age and gender). The study was approved by our Institution Ethics Committee and all patients gave informed consent.

Results: Twenty three patients were included (mean age: 38.61 ± 11.58; 70% Female). Thirty percent presented cardiovascular risk factors without known cardiac disease. We found significant differences between the analyzed periods for all but one (LF/HF) HRV metrics (using Friedman test, p<0.05, two-tailed). Specifically during the post-ictal period, we found a significant reduction for AVNN, SDNN, RMSSD and pNN50 (Wilcoxon test, p<0.05; two-tailed). LF/HF was increased during this period, but changes were not statistically significant. There was also a tendency for a reduction of AVNN, SDNN, RMSSD and pNN50 and an increase of LF/HF in our patients during all the analyzed periods when compared to normative healthy population values.

Conclusion: Our work shows reduced HRV after a GTCS in patients with focal resistant epilepsy, both in inter-ictal and post-ictal periods, when compared to normative healthy population values. These results might reflect long term structural changes in autonomic centers. The HRV changes were significant particularly during the post-ictal period, and should prompt further investigation, giving this period is critical for SUDEP.