

Impaired heart rate variability one and six months post acute COVID-19

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Background: Long COVID-19 syndrome is an increasingly recognized problem. Post-infectious cardiac autonomic dysfunction is commonly reported. This study aims to evaluate autonomic dysfunction by means of Heart rate variability (HRV) on post-COVID-19 patients.

Methods: Hospitalized patients for COVID-19 (either at the medical ward or Intensive Care Unit (ICU)) were followed up at 1 and 6 months after hospital discharge. Medical history and clinical information were collected. HRV was assessed by 24-hour ambulatory electrocardiography Holter, with the measure of the standard deviation of normal RR intervals in 24 h, ms (SDNN). The comparison was conducted with age and sex-matched non-COVID-19 controls.

Results: Thirty-four patients hospitalized with COVID-19 (20.6% admitted in ICU) were examined 1-month and 6-months post-hospital discharge. SDNN was significantly ($p<0.001$) reduced in the COVID-19 group (111±23 ms) compared to the control subjects (152±24 ms) 1-month after discharge. Subgroup analysis between COVID-19 group revealed that ICU

subjects presented significantly ($p<0.001$) reduced SDNN compared to the medical ward, respectively (83±20 ms vs. 118±17 ms). At 6-months, an improvement was noted at SDNN 24h (6-month: 133±24 vs. control: 151±24 ms, $p=0.004$; 1-month: 111±23 ms vs. 6-month: 133±24 ms, $p<0.001$). Also at 6-months, ICU subjects noted significantly ($p=0.003$) reduced SDNN 24h compared to medical ward subjects (107±17 ms vs. 140±20 ms). On the 6-months follow-up, 32% of the subjects had “long-COVID-19” symptoms. Subjects with long COVID-19 symptoms had low SDNN values (“long-COVID-19”: 112±17 ms vs. non-“long-COVID-19”: 142±20 ms, $p=0.001$)

Conclusion: Patients hospitalized for COVID-19 have reduced SDNN, at one month post-hospital discharge which is improved at the six months follow-up. These findings emphasize the increased sympathetic drive activity in the post-acute COVID-19 phase and imply a link between autonomic dysfunction and long COVID-19.

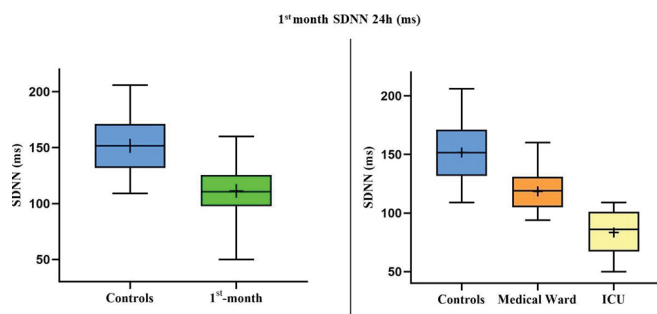


Figure 1. SDNN (ms) at one month

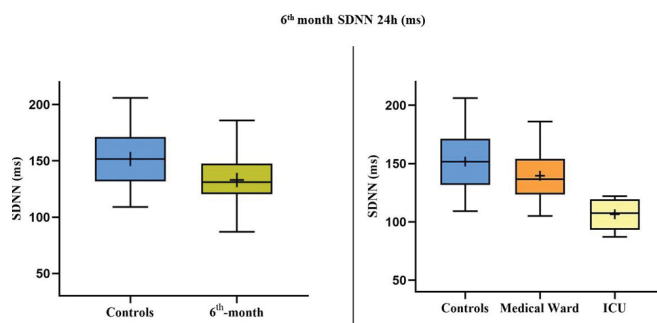


Figure 2. SDNN (ms) at six months