

### Mid-term endothelial dysfunction post COVID-19

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**Introduction:** Cardiovascular complications of Coronavirus disease (COVID-19), resulting from the Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2), have been documented. Endothelium-induced “cytokine storm” in critically ill COVID-19 patients is one of the leading causes of morbidity and mortality. Vascular endothelial damage caused by COVID-19 emphasizes the crucial role of endothelium in COVID-19 clinical impact.

**Purpose:** To examine the mid-term (1-month) impact of COVID-19 in endothelial function.

**Methods:** In this case control study, 20 consecutive patients who were hospitalized for COVID-19 either on Intensive Care Unit (ICU) or non-ICU were examined one month following hospital discharge. In the control group we recruited 12 consecutive subjects from the outpatient cardiology clinic. Demographic and clinical data were collected, and endothelial function was evaluated by brachial artery flow-mediated dilation (FMD).

**Results:** There was no difference in age between COVID-19 patients and control subjects (66±12 years vs. 71±5 years, p<0.17), in male sex (63%

vs. 54%, p=0.66) in history of diabetes mellitus (27% vs. 36%, p=0.64), hypertension (36% vs. 54%, p=0.39), cardiovascular disease (27% vs.18%, p=0.61). From the COVID-19 subjects 65% were overweight or obese. During their hospitalization [3 ICU (15%)/17 non-ICU (85%), mean days: 17±6.7], 4 (20%) of COVID-19 patients developed ARDS, while single cases of stress-induced cardiomyopathy, pulmonary embolism, and acute coronary syndrome were detected. One month post discharge D-dimers (0.71±0.55 µg/ml) levels were above upper reference limit. Importantly, FMD one month after hospital discharge date, was significantly impaired in the COVID-19 group (3.59±1.63% vs. 9.31±2.98%, p<0.001) compared to control group.

**Conclusion:** Post COVID-19 subjects one month post discharge have significant impaired endothelial function compared to control subjects. These findings highlight the significant interaction of COVID-19 with arterial endothelium and merit further research to conclude on the exact impact of vascular endothelium in physical history of SARS-CoV-2 infection.

