**A Prospective Assessment of Correlation between Peripheral Oxyhemoglobin Concentration using Near Infrared Spectroscopy and Epicardial Fat Volume measured by Computed Tomography**

**K. Kuronuma, MDa;** T. Kawamorita, MDa; T. Yagi, MDb; S. Sugai, MDa;S. Hayashida, MDa; K. Iso, MDa; K. Iida, MDa; W. Atsumi, MDa; M. Komoriya, MD; Y. Suzuki, MDb; E. Tachibana, MDa; S. Kunimoto, MDa; N. Matsumoto, MDb; Y. Okumura, MDc; K. Sakatani, MDd

*a Department of Cardiology, Kawaguchi Municipal Medical Center, Japan*

*b Department of Cardiology, Nihon University Hospital, Japan*

*c Division of Cardiology, Department of Medicine, Nihon University Itabashi Hospital, Japan*

*d NEWCAT Institute, Nihon University College of Engineering, Japan*

*Corresponding author e-mail address: keiichirokuronuma@gmail.com*

**Abstract:** Near infrared spectroscopy (NIRS) with a vascular occlusion test (VOT) is a noninvasive technique that evaluates oxidative metabolism and microcirculation. Epicardial fat volume (EFV) is associated with coronary atherosclerosis and cardiovascular events. Furthermore, previous studies have shown that statin therapy affects EFV. The aim of the current study was to assess the correlation between peripheral NIRS with VOT and EFV using cardiac computed tomography (CCT), both in patients with and those without statin therapy. Eighty-three consecutive patients (52 males; median age 69 years) with suspected coronary artery disease, on whom planned CCT was performed between October 2017 and March 2018, were enrolled. Forty patients were prescribed statins. All NIRS examinations were performed before CCT using a NIRO-200NX (Hamamatsu Photonics K.K., Japan), with the patient in the supine position. After the NIRS probe was attached to the right thenar eminence, brachial artery blood flow was blocked for 3 min. Maximum or minimum values during VOT were used to determine concentration changes for total hemoglobin (ΔcHb), oxyhemoglobin (ΔO2Hb), deoxyhemoglobin (ΔHHb) and tissue oxygenation index (ΔTOI). All CCT images were scanned using a Somatom Definition Flash (Siemens, Germany). Pixels in the epicardium with densities of -230 to -30 Hounsfield units were considered epicardial fat. Although ΔTOI, ΔcHb and ΔHHb were not correlated with EFV, an inverse correlation was found between ΔO2Hb and EFV (r = -0.236; p value= 0.03). A stronger correlation was observed in the patients without statin therapy (r = -0.473; p value = 0.00137). Conversely, the correlation was absent in the patients with statin therapy (r = 0.0876; p value = 0.591). This prospective study showed that there was a significant negative correlation between ΔO2Hb and EFV. The findings of this study would help to noninvasively identify patients with high epicardial fat and identity high cardiovascular risk patients.

I prefer:

