

Proof of concept study of Cor-IS impedance spectroscopy for the evaluation of endothelial function

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Abstract

Endothelial function (EF), associated with diseases such as diabetes and coronary artery disease, serves as a robust predictor of cardiovascular health¹. In this Proof of Concept study, we aim to evaluate the capability of the highly sensitive Cor-IS electrical impedance spectroscopy technique (European Patent 3005942 A1, European Patent 3245947 A1) for assessing EF, employing the established Flow-Mediated-Dilation (FMD) medical protocol. Cor-IS technique follows all steps of the standard FMD protocol, including the ischemic cuff occlusion, employing an electrical sensor instead of an ultrasound sensor.

Clinical trials are performed to 4 adults with acute myocardial infarction (AMI) and 4 adults with risk factors (RF) for coronary artery disease, including hypertension and diabetes. Medication-related intervention is applied to AMI & RF patients for 3 and 6 months, respectively. The EF of the clinical subjects is evaluated before and after the intervention. Cor-IS captures continuous bioelectrical signals across a range of excitation electrical signal frequencies, 2 minutes before and 5 minutes after the ischemic cuff occlusion and the subsequent reactive hyperemia². Cor-IS measurements are validated against the FMD ultrasound technique.

Results demonstrate that the ultrasound FMD index (%) increased after medication-relevant intervention, indicating improvement of EF in AMI & RF patients. Specific Cor-IS biomarkers change accordingly in the same group of patients. Extensive clinical trials are ongoing to determine the sensitivity and specificity of Cor-IS method. Once validated, Cor-IS will offer a continuous signal obtained during the FMD protocol where subtle time dependent features of the EF might be discerned, missed by instantaneous ultrasound measurements.

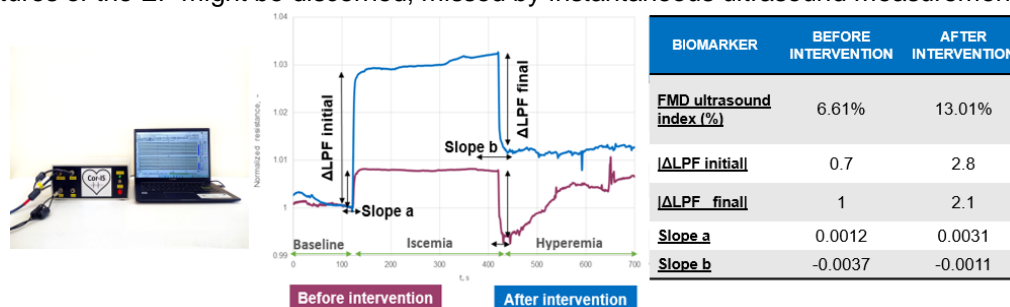


Figure: Example of Cor-IS biomarkers correlation with FMD ultrasound index (%) in a patient

Keywords

- electrical impedance spectroscopy
- endothelial function
- FMD

References

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