

Skin Autofluorescence is an independent marker for Acute Myocardial Infarction.

D.J. Mulder¹, P.L. van Haelst², R. Graaff³, A.J. Smit¹, R.O.B. Gans¹ and F. Zijlstra²;
¹Department of Medicine, ²Department of Cardiology, ³ Department of Biomedical-Engineering, University Medical Center Groningen, The Netherlands.

Introduction: Acute myocardial infarction is associated with an increased burden of oxidative stress, enhancing the intracellular formation of stable Advanced Glycation End products (AGEs) and their precursors. Some AGEs encompass a characteristic fluorescence pattern, which can be non-invasively measured as skin autofluorescence (AF), using the AGE-reader. This is a new device for assessing oxidative stress in tissue in cardiovascular disease.

Aim: A case control study to investigate whether AF is associated with acute ST-elevation myocardial infarction (STEMI) as compared with patients with stable coronary artery disease (SCAD), matched for age and sex.

Methods: AF was defined as the average light intensity in the range of 420 – 600 nm divided by average light intensity in the range of 300-420 nm (emission/excitation) and was measured on the lower arm, using the AGE-Reader. AF was assessed in patients with STEMI within 48 hours following PCI and in SCAD patients scheduled for elective CAG. Patients with impaired renal function, age < 30 years, heart failure, infection or a dark skin type were excluded. Additionally, routine admission blood results were evaluated.

Results: Ninety-two STEMI (mean age: 64.3 ± 12.8 years; 77.2% male; smoking: 42.7%; diabetes: 27.2%) and 81 SCAD (mean age: 63.9 ± 10.3 years; 74.1% male; smoking: 23.9%; diabetes: 15.0%) patients were included. The mean AF was significantly higher in STEMI patients, after correction for diabetes, smoking, cholesterol, WBC and cardiovascular history (OR 2.98; p 0.017). In STEMI patients, 53.3% of the total variance in AF could be explained by age, history of peripheral vascular disease, HbA1c and – remarkably – CRP (p < 0.0001).

Conclusion:

These data demonstrate that enhanced skin autofluorescence is independently associated with STEMI and is strongly related to CRP and HbA1c, making it a promising tool for assessing inflammation and/or (glyc)oxidative stress in high-risk cardiovascular patients.