ApoJ-Glyc, an early marker of myocardial ischaemia, rapidly maps improved myocardial perfusion in STEMI patients undergoing successful primary PCI


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Background: Previous studies using experimental models and clinical retrospective samples have pointed to a potential role of glycosylated apolipoprotein J (Apo-J-Glyc) as a marker for the early detection of myocardial ischaemia. Ischaemia induces intracellular accumulation of non-glycosylated ApoJ that mirrors the reduction in Apo-J-Glyc serum levels in patients presenting with ST-segment elevation myocardial infarction (STEMI).

Purpose: The EDICA (Early Detection of Myocardial Ischaemia in Suspected Acute Coronary Syndromes by Apo J-Glyc as a Novel Pathologically based Ischaemia Biomarker) clinical trial assessed the performance of Apo-J-Glyc in patients with chest pain suggestive of acute coronary syndrome. Here, we report the observed changes in Apo-J-Glyc concentration in STEMI patients at baseline and after primary percutaneous coronary intervention (PPCI).

Methods: The EDICA trial, a multi-centre (10 sites), international, in vitro diagnostic study, assessed 404 patients attending the A&E department with chest pain suggestive of acute coronary syndrome. Blood samples were obtained for the simultaneous assessment of high sensitivity-troponin and Apo-J-Glyc on admission (time 0) and at 1h and 3h thereafter. Two different glycosylated variants of ApoJ (Apo-J-GlycA2 and Apo-J-GlycA6) were analyzed with a novel ELISA in serum samples. Of the “ischaemic” patients, 33 had STEMI, of whom 85% underwent PPCI.

Results: As expected, in the presence of myocardial ischaemia, time 0 Apo-J-GlycA2 and Apo-J-GlycA6 serum levels decreased by 34% and 48%, respectively in STEMI patients, compared with non-ischaemic patients, i.e. Apo-J-GlycA2 in STEMI: 66 [52–95] μg/ml vs. non-ischaemic: 100 [72–131] μg/ml; P=0.0002; Apo-J-GlycA6 STEMI: 38 [34–67] vs. non-ischaemic: 73 [56–95] μg/ml; P<0.0001. Apo-J-GlycA6 showed a discriminating ability for the presence of STEMI with a 67% sensitivity and a 83% specificity (AUC=0.747, cut-off of 50 μg/ml). In STEMI patients in whom PPCI successfully restored TIMI 3 flow, Apo-J-Glyc levels increased rapidly and significantly compared with time 0 levels (Apo-J-GlycA2: P=0.02 and P=0.003 for 1h and 3h; Apo-J-GlycA6: P=0.02 and P=0.002 for 1h and 3h) and compared to patients in whom PPCI was not performed (Table 1).

Conclusions: Apo-J-Glyc concentrations are reduced in STEMI patients on admission and increase rapidly after improved perfusion with PPCI, pointing to a potential role of this biomarker in the early detection of reversible ischaemia and the mapping of reversible changes. The mechanisms whereby Apo-J-Glyc levels rapidly and markedly increase after PPCI are speculative at present and deserve further investigation, together with the potential prognostic value of Apo-J-Glyc in this setting.