Perivascular nerve fibres are increased in the epicardium while perivascular adipose tissue is decreased in the myocardium in patients with acute myocardial infarction

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Background: Vasospasm is an important etiological factor in the induction of acute myocardial infarction (AMI). PeriVascular Nerve Fibres (PVNF) and PeriVascular Adipose Tissue (PVAT) play an important role in vasoregulation, although detailed information of their role in the heart is missing in AMI patients. In the present study we have analysed PVNF and PVAT in deceased AMI patients.

Methods: Sections of epicardial coronary arteries were obtained at autopsy from AMI patients (N=16) and controls without heart disease (N=7). Infarct age was between 3 and 6 hours old. Stenosis of epicardial coronary arteries was quantified in a HE stained slide. To analyse the intramyocardial vasculature samples were taken from the left ventricle of the heart (in AMI patients the infarcted area). Nerve fibres were stained using a specific S100 antibody. Putative activation of these nerves was stained using a specific antibody against neuropeptide Y (NPY). S100+ and NPY+ nerve fibres were quantified by light microscopy and were then calculated per square mm of the adventitia surface areas. PVAT was quantified using an Elastica Von Gieson (EvG) staining.

Results: Stenosis did not correlate with PVNF. AMI patients had a significant increase in PVNF in the epicardium but not in the myocardium. NPY was non-significantly increased in PVNF in the epicardium and myocardium in AMI patients compared with controls. PVAT was significantly decreased in AMI patients compared with controls.

Conclusion: The increase in PVNF in the epicardium and the decrease of PVAT in the myocardium suggest that they might play a role in AMI induction, independent of the atherosclerotic changed epicardial coronary arteries.