

COGNITIVE IMPAIRMENT AFTER STEMI IS ASSOCIATED WITH REDUCED EJECTION FRACTION, AUTONOMIC DYSREGULATION, AND CELL DEATH

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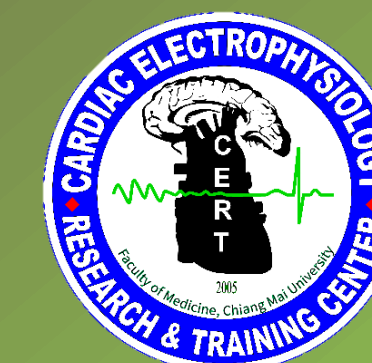
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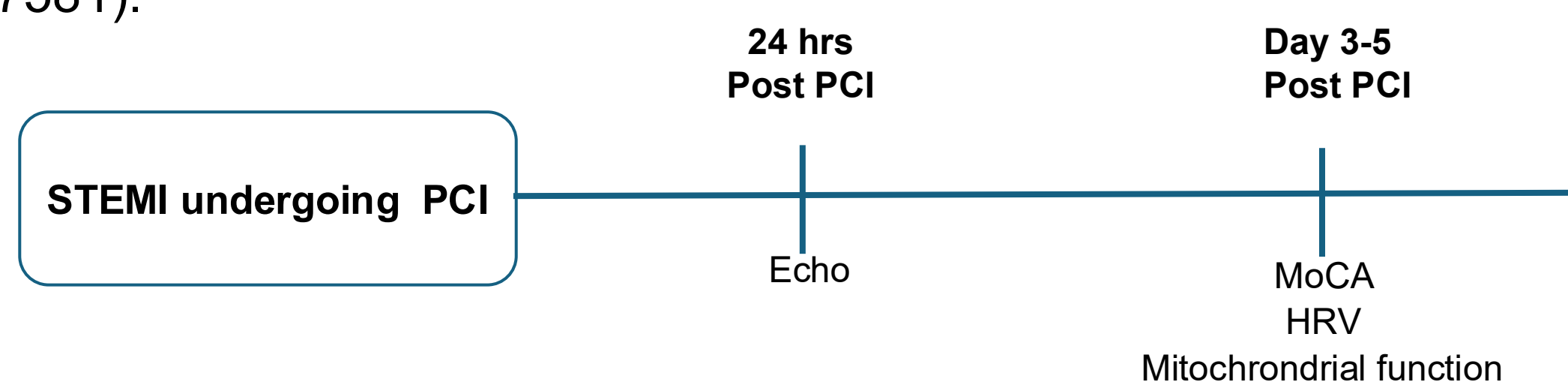
Cognitive impairment in STEMI patients undergoing PCI relates to cardiac function, autonomic dysregulation, and PBMCs cell death.

Background

Cognitive impairment has been reported in patients with acute coronary syndrome undergoing revascularization. Oxidative stress and mitochondrial dysfunction play important roles in pathological changes in the brain, resulting in cognitive impairment, during myocardial infarction. This study aimed to investigate the associations among cardiac function, cardiac autonomic regulation, mitochondrial function in peripheral blood mononuclear cells (PBMCs), and cognitive performance in patients with ST-elevation myocardial infarction (STEMI) undergoing percutaneous coronary intervention (PCI).

Methods

30 hemodynamically stable patients with STEMI undergoing primary PCI were enrolled. Peripheral blood samples were collected to assess mitochondrial function and cell viability in PBMCs. Cardiac function was assessed by echocardiographic ejection fraction (EF), while cardiac autonomic function was evaluated using heart rate variability (HRV) from 24-hour Holter monitoring. Cognitive performance was assessed after PCI using the Montreal Cognitive Assessment (MoCA). This study was approved by the Ethics Committee of the Faculty of Medicine, Chiang Mai University, Thailand, following the Declaration of Helsinki and Good Clinical Practice Guidelines (Approval Number: MED-2563-07581).



Conclusion

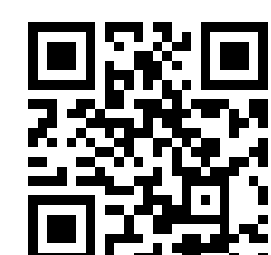
Our findings suggest that cognitive impairment in patients with STEMI undergoing PCI is associated with poor cardiac function, cardiac autonomic dysregulation, elevated cellular oxidative stress, and PBMCs cell death. However, further investigations with larger patient populations are still required.

Acknowledgement

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Contact

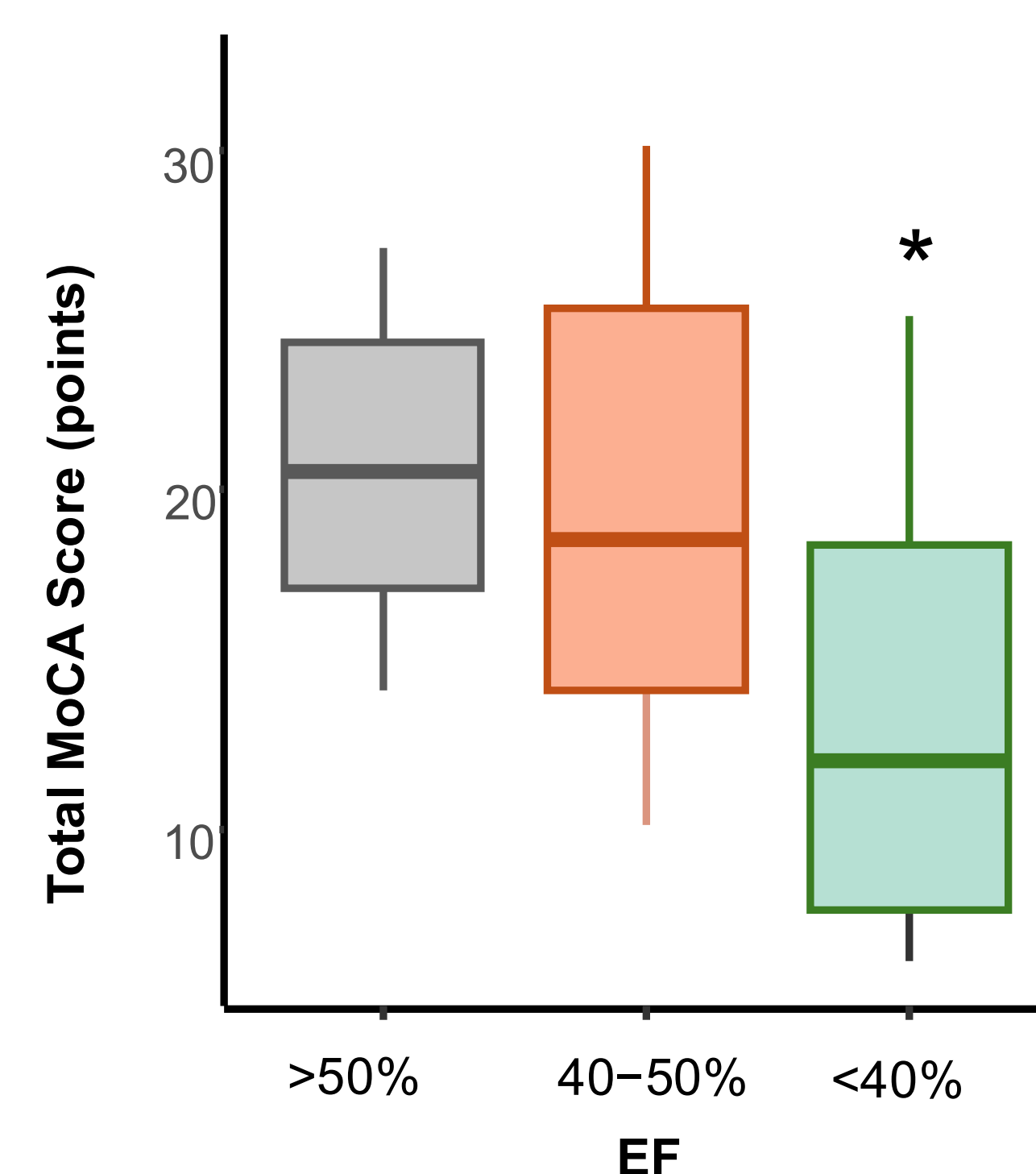


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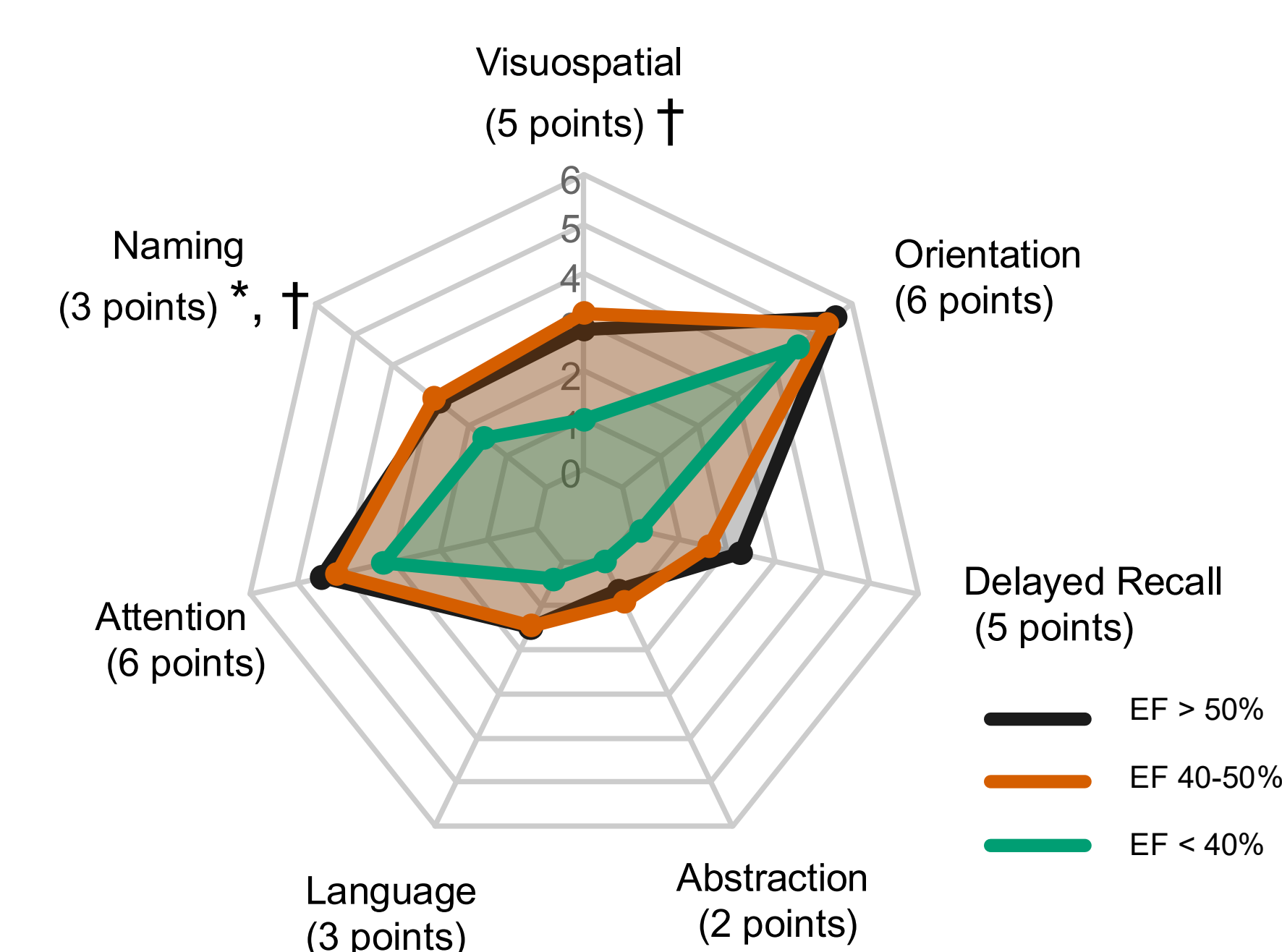
Result

Comparison of MoCA Scores by EF Group



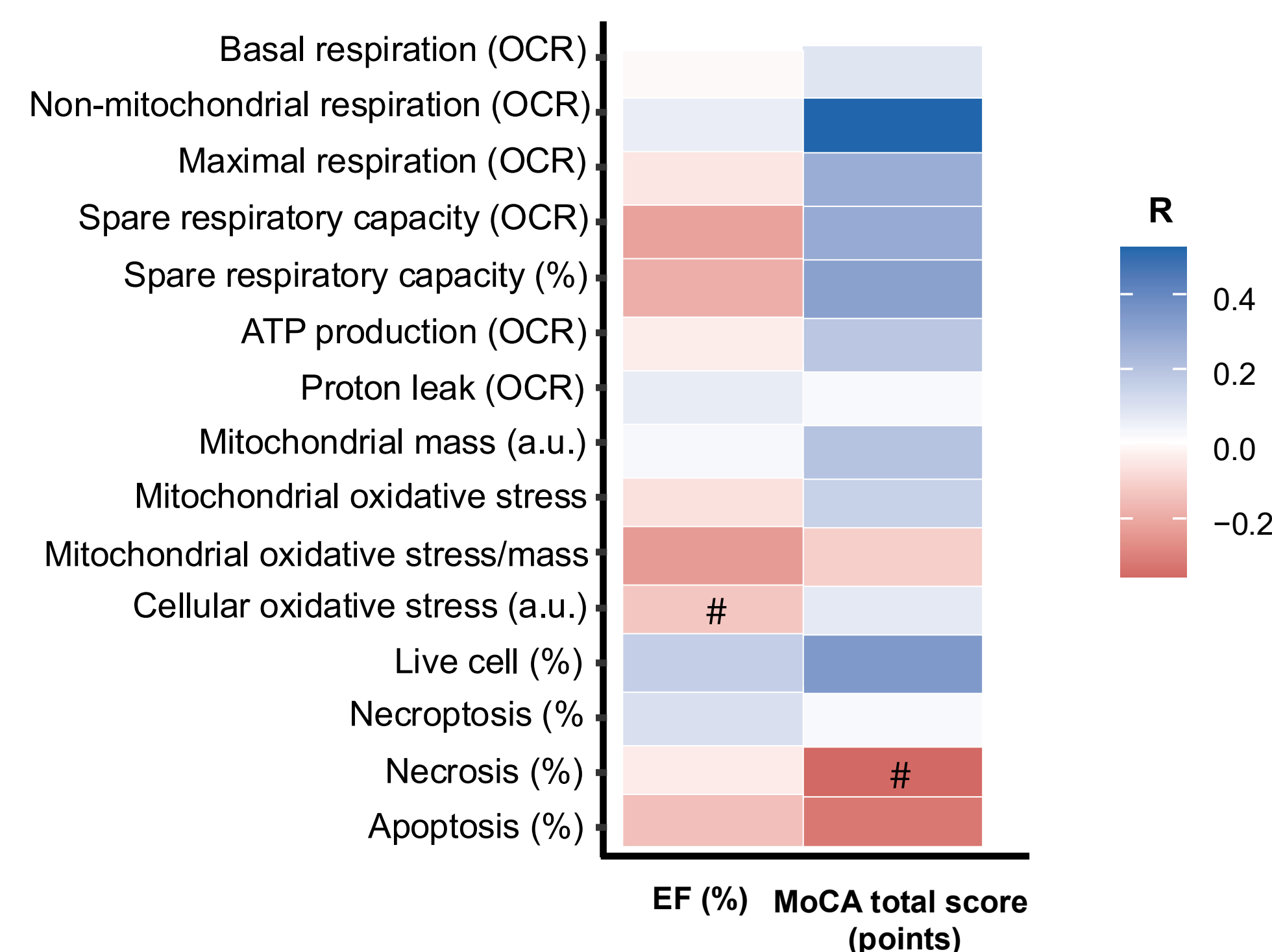
Total MoCA scores were lower in patients with EF < 40% than in those with EF > 50%.

MoCA subdomain scores



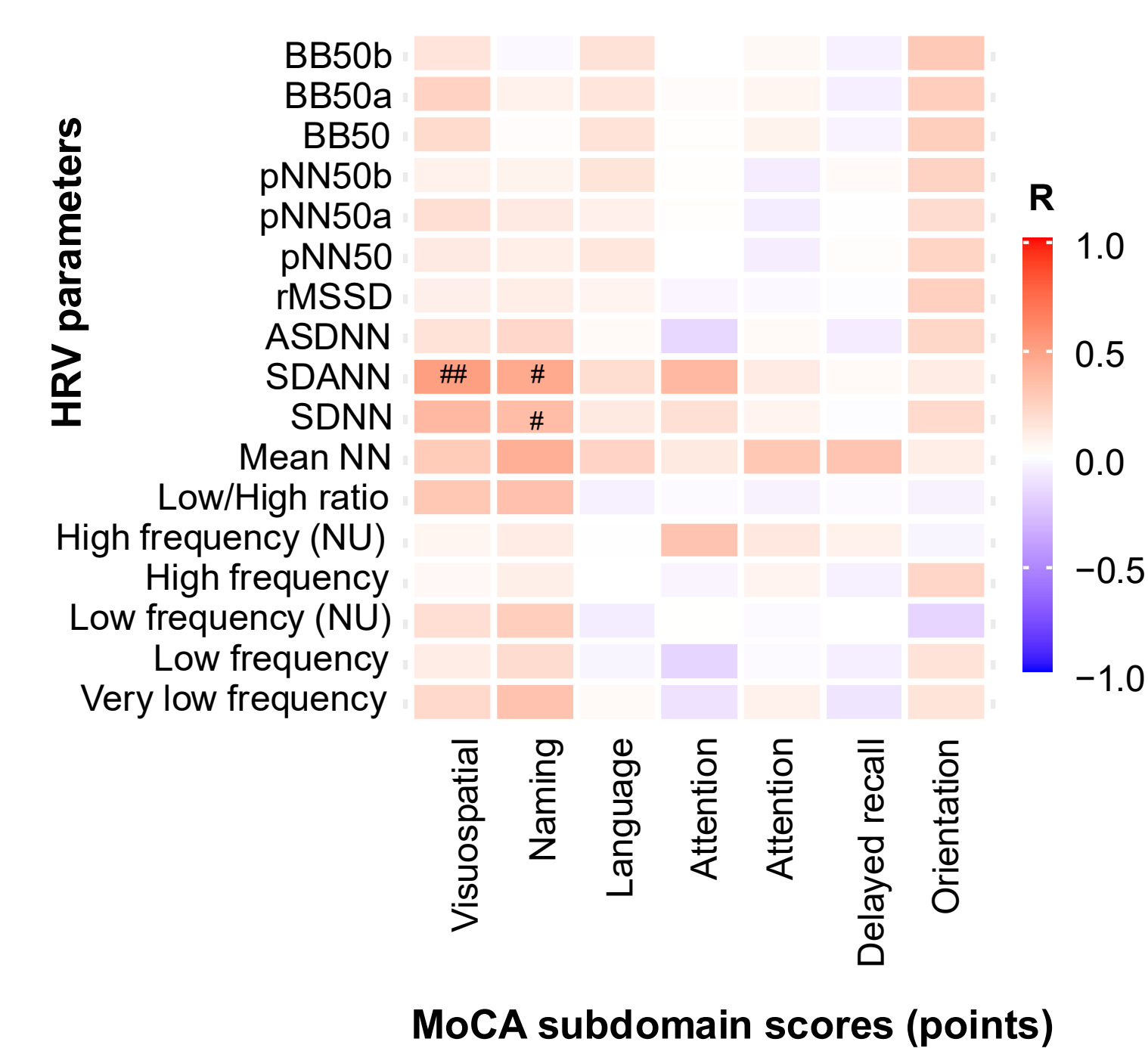
Patients with EF < 40% showed lower visuospatial scores than those with EF 40-50% and lower naming scores than those with EF 40-50% and EF > 50%.

Correlations between mitochondrial function in PBMC and EF and MoCA score



Oxidative stress and PBMC necrosis were inversely associated with EF and MoCA score, respectively.

Correlations between HRV parameters and MoCA subdomain scores



HRV analysis showed that SDANN was positively correlated with the visuospatial and naming subdomains, while SDNN was positively correlated with naming performance.

Statistical analyses were performed using the Kruskal-Wallis test and Spearman's rank correlation. * < 0.05 compared with the EF > 50% group; † p < 0.05 compared with the EF 40-50% group; # p < 0.05 by Spearman's rank correlation. EF: Ejection Fraction; MoCA: The Montreal Cognitive Assessment; PBMC: peripheral blood mononuclear cell.