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¹Neurology, ²Internal Medicine, ³Cardiology, ⁴Radiology

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Introduction

Cardiovascular reactivity (CR) was defined by beat indices, ratio (R) or difference (D) between higher maximal or minimal heart rate on higher maximal or minimal pulse rate at 24 hours Arterial Pressure Measurements (HAPM). A value < 1 or > 1 were considered as negative (NCR) or positive CR (PCR), respectively [Fiori P., et al, 2020].

The aim of the current study was to examine haematological, haemodynamic and radiological patterns on the basis of CR in order to better define short- and long-term prognosis in Acute Ischaemic Syndrome (AIS).

Materials and Methods

We recruited 74 AIS (30 males, 44 females) and subgrouped them on the basis a PCR $\geq 1,5$ (age 65,9 sd 15,9 yrs), PCR $< 1,5$ (age 73,6 sd 11,7 yrs), NCR (age 76,7 sd 11,6 yrs). They underwent blood withdrawal, HAPM, MRI within one week. Lesional load was calculated according to Fazekas' criteria. Moreover, we considered juxtacortical ischaemic lesions and microbleeds, evaluated as rare (1:1-3), sporadic (2:3-6), multiple (3:>6) at FLAIR-T2 and SWI-Weighted-MRI sequences.

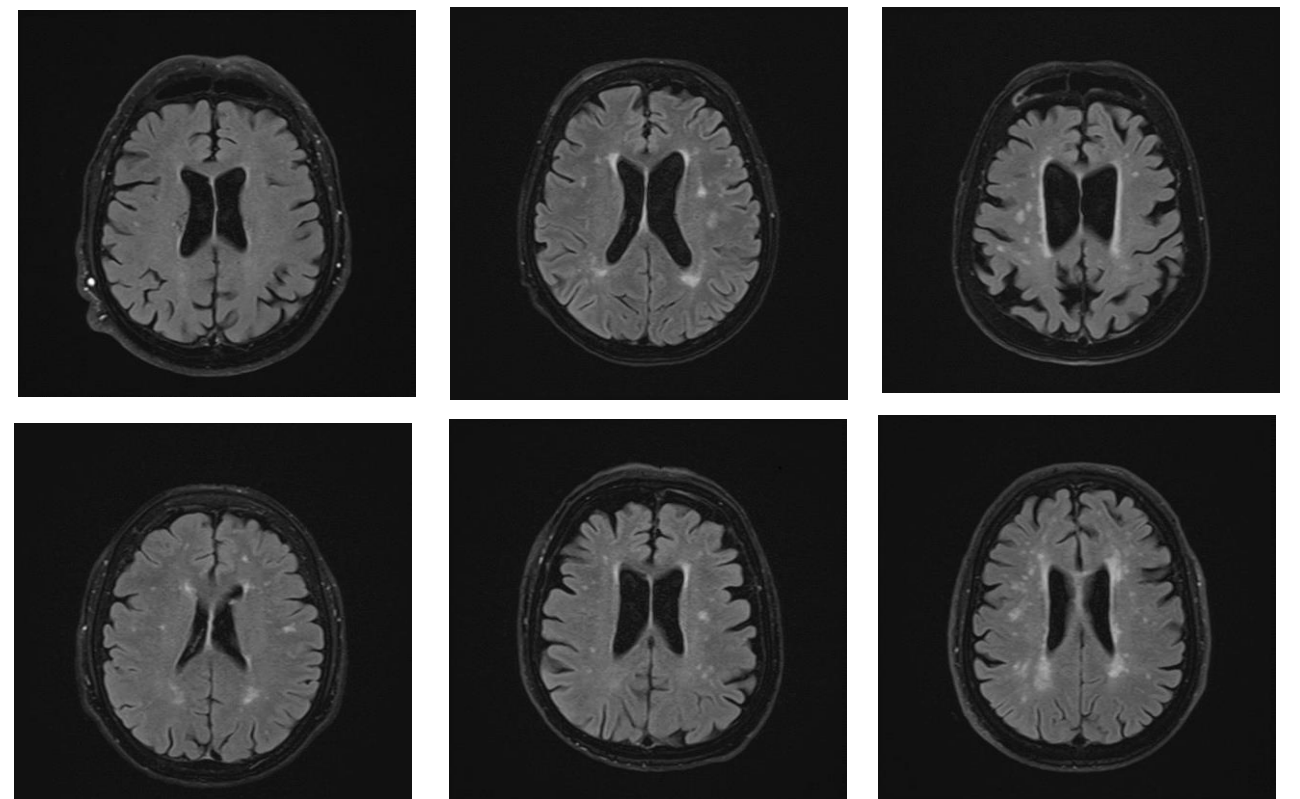
Results

Significantly higher Mean Blood Pressure (MBP, $p 0,002$), Max MBP ($p 0,0003$), Pulse Rate sd (PR, $p 0,001$), lower Heart Rate sd (HR, $p 0,002$), higher levels of hs troponin (hs tro, $p 0,05$), Brain Natriuretic Peptide (BNP, $p 0,06$) and Albumin (Alb, $p 0,02$) were present in NCR compared to PCR patients. Higher percentage of conduction disorders were present in NCR compared to PCR patients, especially Atrio-Ventricular Blocks (BAV) (6/22, 27% vs 3/53, 5,7%). Lesional load was higher in NCR compared to PCR patients (PV, $p 0,02$; DWM, $p 0,01$; SC, $p 0,01$; SWI BD, $p 0,09$), above all in the group of NCR patients with BAV, except SWI BD. Significant correlations were present among RMN findings and MBP (PV/MBP $r 0,41$, DWM/MBP $0,44$, SC/MBP $r 0,41$, SWI BD/MBP $0,38$) and albuminuria (PV/Alb $0,35$, DWM/Alb $0,27$, SC/Alb $0,35$, FLAIR BD/Alb $- 0,26$, SWI BD/Alb $- 0,22$) in NCR patients.

References

Fiori P. et al.: Central Genesis of Dysrhythmia. Neurology and Neurobiology 2020;3: 2-8, doi: 10.31487/j.NNB.2020.02.02

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FLAIR MRI images in PCR $\geq 1,5$ (left), PCR $< 1,5$ (middle), NCR (right) AIS patients.

Discussion

Autonomic Nervous System function reflects individual vulnerability to environmental perturbations and capacity to cope with stressors. Its failure predicts higher susceptibility to diseases. Our previous study suggested a central genesis of dysrhythmia. Episodes of NCR are recorded also in healthy subjects and patients with other neurological diseases. NCR is a negative predictive parameter of increased risk of worst prognosis, atrioventricular conduction disorders, increased, irreversible lesional load in AIS. The correlations with MBP and albuminuria stand for an allostatic load, leading to homeostatic imbalance, followed by a cascade of multiple negative events, triggering a vicious, ischaemic cycle.