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Stroke 3

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Stroke 3
Thrombus histology and cryptogenic stroke — a different approach to determine etiology

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Objective: Ischemic stroke of undetermined cause is considered to be a major health issue and therefore recommended to be a top research focus in the field. Histopathological analysis of human "in-vivo", mechanically extracted thrombi of patients with large vessel occlusion may contain additional "in-depth" information concerning the underlying pathology. Aim of this study was to elucidate the clinical problem of cryptogenic stroke by use of a multiparametric approach, analyzing histological, interventional and clinical outcome data of stroke patients.
Methods: Thrombi of 145 consecutive patients with large vessel occlusion were collected during mechanical recanalization. The HE-stained specimen was analyzed concerning overall appearance and relative quantitative component fractions of erythrocytes, fibrin/thrombocytes and leucocytes. Detailed clinical and interventional data were obtained. Statistical analysis was performed searching for significant differences or pattern similarities in different stroke subtypes, defined by the international TOAST criteria. IRB and patient approval has been obtained.
Results: In a consistent and conclusive overall pattern, arterio-embolic and TOAST 4 (mostly dissections) differ significantly from cardio-embolic and cryptogenic stroke subtype in histological parameters (e.g. lower erythrocyte fraction in cardio-embolic and cryptogenic groups, $p = 0.038$), interventional (e.g. higher number of maneuvers in cardio-embolic and cryptogenic groups, $p = 0.012$) and outcome (e.g. higher mRS in cardio-embolic and cryptogenic groups, $p = 0.011$) data. Cardio-embolic and cryptogenic subtype show matchable thrombus structure and similar clinical and interventional characteristics.
Interpretation: The findings of this multiparametric approach strongly support the hypothesis of predominantly cardio-embolic mechanisms accounting for the majority of cryptogenic strokes.

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Blood based biomarkers to identify subclinical brain damage in essential hypertension

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Background: Neuroimaging has demonstrated that subclinical brain damage in essential hypertension is more prevalent than cardiovascular or renal impairment; nevertheless, screening for nervous system involvement is difficult due to low accessibility and high cost techniques.
Objective: To explore if hemochemical markers of brain damage and inflammation could predict the presence of subclinical brain damage in hypertensive patients.
Patients and methods: 101 patients with essential hypertension and 53 controls with no clinical evidence of neurological disease were recruited. Serum concentrations for two brain specific proteins (S100B and neuron specific enolase, NSE) and for inflammatory markers (C-reactive protein, CRP; α1-antitrypsine, AAT; C3 and C4 complements) were determined. Target organ damage (TOD) to the brain, heart and kidneys was evaluated in HT patients. Patient and Institutional Review Board approval were obtained.
Results: Multiple regression analysis revealed that only NSE and CRP were independently associated with the condition of being hypertensive. NSE was associated to diastolic blood pressure and grade of retinopathy. TOD to the 3 organs was evaluated in 34 patients, showing damage to the brain in 70.6%, heart in 58.5% and kidneys in 50%. NSE was associated with more severe MRI damage (white matter hyperintensities), while inflammatory markers were not related to TOD. After ROC analysis, NSE (cutoff level: 11 μg/L) was found to predict more severe MRI lesions with 84% sensitivity and 55% specificity.
Conclusion: Serum NSE could constitute a starting point for future investigations in the field of blood based biomarkers for the detection of subclinical brain damage in arterial hypertension.

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Imaging assessment of post cardiac arrest hypoxic ischemic encephalopahty

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