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Chronic defensiveness and neuroendocrine dysregulation reflect a novel cardiac troponin T cut point: The SABPA prospective study

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Sympathoadrenal responses are activated as an innate defensive coping (DefS) mechanism during emotional stress. Whether these sympathoadrenal responses drive cardiac troponin T (cTnT) increases are unknown. Therefore, associations between cTnT and sympathoadrenal responses were assessed. A prospective cohort, excluding atrial fibrillation, myocardial infarction and stroke cases, was followed for 3 years (N=342; 45.6 ± 9.0 years). We obtained serum high-sensitive cTnT and outcome measures [Coping-Strategy-Indicator, depression/Patient-Health-Questionnaire-9, 24h BP, 24h heart-rate-variability (HRV) and 24h urinary catecholamines]. Blacks showed moderate depression (36% vs. 13%) and 24h hypertension (67% vs. 42%) prevalence compared to Whites. A receiver-operating-characteristics cTnT cut-point 4.2 ng/L predicted hypertension in Blacks [AUC 0.68 (95% CI 0.60-0.76); sensitivity/specificity 63/70%; P≤0.001], which was used as binary exposure measure in relation to outcome measures. In cross-sectional analyses, elevated cTnT was related to DefS [OR 1.34 (95% CI 0.98-1.83); P=0.06]; 24h BP [OR 1.03-1.04 (95% CI 1.01-1.08); P≤0.02] and depressed HRV [OR 2.19 (95% CI 1.09-4.41); P=0.03] in Blacks, but not in Whites. At 3 year follow-up, elevated cTnT was related to attenuated urine norepinephrine:creatinine ratio in Blacks [OR 1.46 (95% CI 1.01-2.10); P=0.04]. In Whites, a cut point of 5.6 ng/L cTnT (P≤0.001) predicted hypertension but was not associated with outcome measures. To conclude, central neural control systems exemplified a brain-heart stress pathway. Desensitization of sympathoadrenal responses occurred with initial neural- (HRV) followed by neuroendocrine dysfunction (norepinephrine:creatinine) in relation to elevated cTnT. Chronic defensiveness may thus drive desensitization, reflecting ischemic heart disease risk in Blacks at a 4.2 ng/L cTnT cut-point.

Biography

Leoné Malan aims to underpin a novel pathway pertaining brain-heart health. Considering this focus, she designed the first well-controlled psychophysiological prospective cohort study in Sub Saharan Africa (SABPA), and as PI received an international award for design excellence (France, 2008). She conceptualized a hypertension research clinic on-campus and induced cardiovascular monitoring programs. Apart from being a council member of the European Society Cardiology on Hypertension, she holds various professional memberships. She and her international expert and pharmaceutical stake holders' network aims to develop a diagnostic tool to phenotype stress and related cardiomyopathy.

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