P170: A FOREHEAD AND NASAL BRIDGE PULSE OXIMETER COMPARISON MEASUREMENTS ON HEALTHY SUBJECTS

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RELATIONSHIP BETWEEN COMMON CAROTID DISTENSIBILITY/AORTIC STIFFNESS AND LEFT VENTRICULAR MORPHOLOGY AND FUNCTION IN RHEUMATOLOGIC PATIENTS

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Introduction: Arterial stiffness is known to be associated with atherosclerosis, cardiac remodelling and cardiovascular diseases. In recent studies, common carotid artery rigidity was seen to better predict cardiac morphology and function if compared to aortic parameters. The aim of the study was to determine the relation between carotid/aortic stiffness indices and the main echocardiographic measures in patients with rheumatological disease.
Methods: 208 participants were evaluated (57,4 ± 11,4 yr; males = 36,1%); 65,9% were previously diagnosed with rheumatoid arthritis, 20,2% with psoriatic arthritis and 13,9% with ankylosing spondylitis. In each subjects medical history, use of drugs and glico-metabolic status was assessed. Echocardiography, blood pressure (BP) measurement and carotid ultrasonography were performed. Carotid Distensibility (CD) and Aortic Stiffness (AoS) were measured as indices of arterial stiffness.
Results: Mean Left Ventricular Mass indexed by body surface area (LVM/BSA) and Relative Wall Thickness (RWT) were 98,8 ± 20,7 g/m^2 and 0,46 ± 0,06, respectively. In multiple regression analysis, DC was correlated with age (β = 0,325, p < 0,0001) and mean BP (β = 0,502, p < 0,0001) while AoS was not associated with any anthropometric, anamnestic and vascular parameters. DC has been seen to inversely correlate with LVM/BSA (r = −0,20, p = 0,005), Intraventricular Septum and Posterior Wall Thickenss; a direct correlation between AoS and left E/e' (a diastolic function indicator) has emerged (r = 0,191, p = 0,007).
Conclusion: Results are consistent with a possible predictive role of DC assessment in left cardiac hypertrophy and remodelling and a direct link between AoS and left ventricular diastolic function.

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A FOREHEAD AND NASAL BRIDGE PULSE OXIMETER COMPARISON MEASUREMENTS ON HEALTHY SUBJECTS

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Photoplethysmography (PPG) is a biophotonic technique which measures blood volume variations in vascular bed and it is well known for its utilization in pulse oximetry for the estimation of arterial blood oxygen saturation. Moving particles within the tissue bed generate rapidly changing absorption caused by the heart beats, while stationary components will cause a relatively constant absorption. The detected light in PPG is therefore composed of an alternating pulsatile component (A) and a constant direct component (B), the both components are utilized for calculating the oxygen saturation estimation. The two LEDs (660 nm & 940 nm) are typical for pulse oximetry. In pulse oximetry, good high-quality RED LED and IR LED generate raw PPG signals (A + B) in both wavelength which are acquired by a single photosensor. Arterial oxygen saturation (SpO2) is estimated from PPG signals acquired from the custom-made nasal bridge PPG sensor and a commercial forehead SpO2 sensor (Medtronic). The SpO2 is calculated based on an empirical formula, SpO2 = 110−R*25, where R = [(A/B)]RED/[(A/B)]IRThe arterial oxygen saturation were 98-100% in healthy young subjects measured from the forehead, whereas elderly people gave 95% - 97%. The use of pulse oximeters increases, and their needs for higher performance. We have measured with the nasal bridge PPG based pulse oximeter and analyzed the test results according to the empirical equations.
Results: Show a rhythmic fluctuation caused, e.g., respiratory activity. The comparison between the commercial device with the custom-made nasal bridge device results were compared because they have different measurement location.

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CARDIOVASCULAR RISK EVALUATION IN BEHCET'S PATIENTS − THE ROLE OF CHRONIC INFLAMMATION IN ARTERIAL STIFFNESS

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Introduction: Behcet's disease (BD) is a chronic inflammatory syndrome with systemic manifestations. Systemic vasculitis contribute to vascular aging, increasing the arterial stiffness that can be inferred from the Pulse Wave Velocity (PWV) measurement. Carotid ultrasound evaluation allows vascular wall changes detection, as the increase of intima-media thickness (>IMT) and plaques. These alterations increase cardiovascular risk (CVR).
Methods: 49 patients were included. Anthropometric, sociodemographic, laboratorial, comorbidities, medication, peripheral and central blood pressure, Systematic Coronary Risk Evaluation, PWV and carotid ultrasound abnormalities data were evaluated. To understand the role of chronic inflammation in arterial stiffness, comparative analyzes were performed with a control group with CVR factors and with a group of healthy individuals.
Results: The sample consisted mainly of women (61.2%), characterized by 30.6% of arterial hypertension, 32.7% of dyslipidemia, 4.1% of diabetes and 14.3% of obesity. PWV median value was 8.32m/s, with 30.6% PWV > 90th percentile of the normal reference population and 16.3% with target organ lesion. >IMT in the common carotid artery (CCA) and plaques were observed in 10.4% and 41.7%, respectively. In the obtained linear regression model, the variables systolic central blood pressure and 'IMT in the ACC showed a statistically significant impact on PWV. In the established comparisons, PWV did not present statistically significant differences. Conclusion: The integrated analysis of the collected data made it possible to requalify the patients in the context of the CVR, allowing the early adoption of control measures. Chronic inflammation associated with BD did not lead to significant differences in arterial stiffness.

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