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Introduction: Endothelial dysfunction is a characteristic of systemic arterial hypertension and an early marker of atherosclerosis. Aerobic training (AT) is known to improve endothelial function, but little is known about the effects of resistance training (RT) and combined training (CT) on endothelial function. Objective: To evaluate the effect of AT, RT and CT on endothelial function in individuals with hypertension.
Methods: Thirty-seven individuals with hypertension (53.8 ± 10.6 years old, systolic blood pressure 134.3 ± 13.1 mmHg, and diastolic 84.3 ± 12.1 mmHg) were randomly allocated in 3 groups: AT (n = 13, 40 min of cycle ergometer at 65% maximum heart rate − HRmax), RT (n = 12, 6 exercises, 4 sets/12 repetitions at 60% maximum strength − 1RM) and CT (n = 12, RT + AT, as follows: 6 exercises, 2 sets/12 repetitions at 60% 1RM, and AT: 20 min in cycle ergometer at 65% HRmax). All of them performed two sessions/week, 40 min/session, during 8 weeks. Endothelial function was evaluated by the brachial artery flow-mediated dilation (FMD). We conducted Generalized Estimating Equation, post-hoc Bonferroni, to assess differences among groups ($p < 0.05$).
Results: All parameters (age, blood pressure, and FMD) were similar among groups at study entry. The different modalities of exercise determined similar benefits in %FMD, when compared pre- and post-training moments (within each modality): AT 9.96 ± 4.34 versus $13.13 \pm 5.74\%$ ($\Delta3.17\%$, $p < 0.001$); RT 9.84 ± 4.53 versus $14.35 \pm 6.41\%$ ($\Delta4.51\%$, $p = 0.001$) and CT 9.68 ± 4.95 versus $16.23 \pm 8.44\%$ ($\Delta6.55\%$, $p = 0.001$). When %FMD was compared among groups, no difference was observed ($p = 0.248$).
Conclusions: The different modalities were efficient and similar in improving endothelial function, through flow-mediated dilatation, in individuals with hypertension.

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DIURNAL RHYTHM OF CENTRAL BLOOD PRESSURE DURING TWENTY-FOUR-HOUR AMBULATORY MONITORING

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It's known that ABPM is better in diagnosing hypertension than office-based measurements. Growing evidence supports that cBP is stronger predictor of cardiovascular risk than brachial BP. Dipping status of subjects can be assessed based on night-to-day BP ratio derived from ABPM. However, there is no data regarding diurnal rhythm of central hemodynamics. Arteriograph 24 is suitable for 24-hour monitoring of both central and brachial BP. The aim of our study was to compare the 24-hour pattern of peripherial and central BP in same patients.
Patients and methods: 24-hour aortic BP-monitoring was performed with Arteriograph 24 in 46 subjects (30 male, 16 female). Measurements were carried out with Arteriograph 24 − a combination of a "single" Arteriograph and an ABPM. Mean age of patients were 55.36 years. Their dipper status was assessed according to the ESH-guidelines and the circadian variation of central hemodynamics was determined as the difference of peripherial and central BP during day and night.
Results: Only 7 of 46 subjects were non-dipper according to their brachial BP. All of them had elevated central BP at night. In contrast we observed elevated AIx and higher cBP during nighttime in further 30 cases who had dipping of nighttime brachial BP.
Conclusions: cBP have diurnal rhythm but the circadian variation of cBP is not necessarily parallel with the corresponding peripheral values. Theoretically elevated peripheral vascular resistance during night helps to maintain the appropriate cBP to provide the cerebral, coronary and renal perfusion. If this observation is confirmed by further large-scale trials the clinical implications of dipping status could be reconsidered.

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APPLICATION AND REPLICABILITY OF BILATERAL AND SIMULTANEOUS MULTIPLE ARTERIAL BLOODPRESSURE MEASUREMENTS IN SEDENTARY AND PHYSICALLY ACTIVE PROFESSIONS

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Background: Lack of physical activity is endemic in office life. Sedentary associated disorders include general adaptation syndrome ('stress'), musculoskeletal, cardiovascular, metabolic and overweight. These conditions provoke absenteeism. Purpose: We evaluated applicability and replicability of a novel multi-arterial blood pressure device in healthy sedentary and physically active, non-sedentary individuals in their professional environment.
Methods: Arterial properties of 20 asymptomatic (46,0(SD12.9) years, 6 sedentary and 14 non-sedentary volunteers) were assessed twice. A Vascassist device and Vasometrix software (iSYMED/Adiphea, Butzbach, Germany) was used. Ankle-brachial index (ABI) and pulse wave velocity (PWV) were calculated. Central Aortic Pressure (CAP) and Vascular Age (VA) were calculated using general transfer functions (GTF's).
Results: Initial RR's were raised (134(SD15.6)/81(12.6) versus 124(10.6)/73(10.8) mmHg in repeat assessments, $p < 0.001$). Intial and repeat ABI's (1.20(SD0.08), 1.20(0.08)%, r = 0.78), and PWV's (10.3(SD1.6), 10.2(1.4)m/s, r = 0.85) were highly correlated. So were CAP's (116.3(9.4) and 115.5 (9.4mmHg), and VA's (39,7 (12.8) and 41.0 (11.9)years). Sedentary subjects showed increased initial SBP's ($\Delta9.0$mmHg, $p = 0.03$), DBP's ($\Delta14.2$ mmHg, $p < 0.001$), and VA's ($\Delta11.1$yrs, $p = 0.04$), but not in repeat assessments (all p's > 0.1). ABI's in the active were lower (1.17(0.05) vs. 1.28(0.07)%: p's < 0.001), as were diastolic CAP's (Δ's 14.3 and 12.5 mmHg; p's<0.01). ΔPWV's were indifferent.
Conclusions: As in clinic, in corporate environments 'white coat' hypertension is observed and can be considered an autonomic response being more outspoken in the sedentary. RR, ABI, PWV, CAP and VA proved highly replicable endpoints. Simultaneous multiple arterial blood pressure assessments and validated GTF modelling create robust functional and structural arterial endpoints for efficacy evaluation of pharmaceutical, nutriceutical and lifestyle cardioavascular health interventions.

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LEUKOCYTE TELOMERE LENGTH AND ITS RELATION TO NITRIC OXIDE METABOLITES IN A BI-ETHNIC SAMPLE: THE SABPA STUDY

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Objectives: Shorter leukocyte telomere length is associated with cardiovascular risk and decreased nitric oxide bioavailability. Aforementioned are also linked with increased oxidative stress and inflammation. 1,2 Telomere length, NO metabolites (NOx), blood pressure, oxidative stress and inflammation markers in a bi-ethnic population were compared. The associations of telomere length with NOx and markers of oxidative stress and inflammation were investigated.
Methods: Included were 152 black and 186 white teachers, aged 23 to 68 years. Ambulatory blood pressure was measured. Leukocyte telomere length, NOx and glutathione peroxidase (GPx), marker of oxidative stress, interleukin-6 (IL-6), tumor necrosis factor-α (TNF-α), inflammatory markers and L-citrulline, marker of NO synthesis, were analysed.