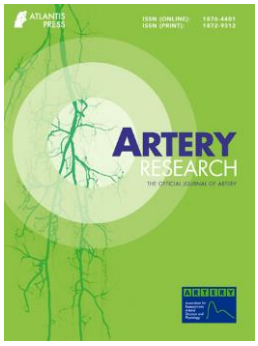

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P5.08: ACUTE CHANGES IN CAROTID DIAMETER AND THICKNESS AFTER AND IRONMAN COMPETITION

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descending thoracic aorta sites using MRI (As and DsAoPWV). Local PWVs were calculated using Bramwell-Hill equation and all velocities were expressed in m/s. We included 72 normotensive non diabetic subjects (56.7% men), free from overt cardiovascular disease.
Results: In these 42±15 yrs-old subjects, having SBP/DBP 119±11/66±8 mmHg, PWV increased from proximal to distal segments: AsAoPWV=5.37±2.07 m/s; ArchPWV= 5.47±2.07 m/s; DsAoPWV=5.45±1.40 m/s; carPWV=5.79±1.5 m/s; and cfPWV=7.65±1.58 m/s. In univariate analysis, all PWVs strongly increased with age (r^2 ranging from 0.36 for ArchPWV to 0.54 for AsAoPWV; $p<0.0001$). The stiffness gradient between AsAoPWV and CarPWV reversed with ageing. ($r=0.42$, $p<0.001$). Mean blood pressure (MBP) was more strongly associated with CarPWV and cfPWV ($r=0.53/0.71$ respectively; $p<0.001$).
Conclusion: In this cohort of normotensive subjects we showed that age and BP had different effects on various segments of large proximal arteries. Age was a determinant of arterial stiffness in all carotid and aortic segments, with a more pronounced influence on AsAoPWV whereas MBP affected more aortic stiffness on the carotid-femoral pathway.

P5.08
ACUTE CHANGES IN CAROTID DIAMETER AND THICKNESS AFTER AND IRONMAN COMPETITION

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Objective: The aim of this study was to evaluate the acute effects of participation in Ironman triathlon competition on carotid properties, in relation to hemodynamic load.
Methods: 28 male triathletes (41±8 years), participating at the Ironman competition (swimming 3.8 km, cycling 180 km, running 42,2 km; 13 athletes performed half-race), underwent carotid and cardiac ultrasound examinations at rest and within 20' from the arrival. Right carotid diameter (D), distension (ΔD) and Intima-Media-Thickness (IMT) were estimated by an automatic system applied to ultrasound B-mode image sequences, and carotid pulse pressure (PP) by tonometry.
Results: The mean duration of the competition was 12:48±1:14 h (6:14 ± 0:37 hrs for the half-race). At the end of the competition the athletes showed increased heart rate (60.2±13.1 to 82.8±15.6 bpm, $p<0.0001$), unchanged mean BP (93±14 to 91±10 mmHg, p=ns), carotid PP (from 42 to 42 mmHg, p=ns), and stroke volume (64±14 to 59±16 ml, p=ns) and total body water (48.0±4.0 to 46.5±3.9 kg, p=ns). Cardiac output was significantly increased (5.5±1.2 to 6.7±2.4 l/min, $p<0.05$), and total peripheral resistances were reduced (17.6±3.9 to 14.8±4.6, $p=0.01$). D was increased (7.19±0.65 to 7.61 ± 0.76mm, $p<0.05$), while IMT was significantly reduced at the end of the competition (537±70 to 495±70 μm, $p<0.05$). ΔD and CC were not modified (588±139 to 568±168 μm and 1.12±0.58 to 1.22±0.54 mm^2/KPa, p=ns).
Conclusions: In an Ironman competition, strenuous exercise induced a marked carotid dilation and a decrease in IMT.

P5.09
INCREASED SYSTEMIC VASCULAR RESISTANCE DURING MODERATE EXERCISE INDEPENDENTLY PREDICTS A HYPERTENSIVE RESPONSE TO EXERCISE

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Background: A hypertensive response to exercise (HRE) at moderate intensity is an independent risk factor for cardiovascular events and mortality, but the underlying mechanisms are unknown. This study sought to determine the haemodynamic predictors of exercise blood pressure (BP) and an HRE.
Methods: Study sample comprised 75 consecutive patients (aged 57±10 years; 73% male) who were free from coronary artery disease and had completed a clinically indicated exercise stress test. Participants were stratified according to systolic BP (SBP) at moderate exercise intensity (Bruce protocol stage 2) with the highest tertile (SBP ≥169 mmHg) defined as an HRE. All participants underwent comprehensive haemodynamic assessment at rest and during moderate exercise; including, brachial and central BP, aortic stiffness, cardiac output (CO) and systemic vascular resistance (SVR; using bioimpedance).
Results: At rest, subjects with HRE had higher body mass index (BMI), triglycerides, aortic stiffness, brachial and central BP compared with normal exercise BP responders ($p<0.05$ for all), but no difference in resting SVR ($p>0.05$). During exercise, subjects with HRE had normal CO but significantly increased SVR ($p=0.033$) and, of all variables measured, this had the strongest correlation with exercise brachial and central SBP ($r=0.527$ and $r=0.626$ respectively; $p<0.001$). On multiple regression, exercise SVR ($\beta=0.357$, $p=0.002$) predicted exercise brachial SBP, independent of age, sex and BMI (Adjusted $R^2=0.399$, $p<0.001$).
Conclusions: Increased SVR during moderate exercise is independently related to exaggerated exercise SBP (HRE) in people undergoing clinically indicated stress testing. This suggests that abnormal peripheral vascular function may be a mechanism explaining exercise hypertension.

P5.10
MAJOR BRACHIAL-TO-RADIAL-SYSTOLIC-BLOOD-PRESSURE-AMPLIFICATION OCCURS IN HEALTHY PEOPLE AND IS SIGNIFICANTLY INCREASED WITH AGE

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Objectives: The reference standard for non-invasive central blood pressure (BP) measurement is radial tonometry calibrated using brachial BP. Brachial-to-radial-systolic-BP-amplification (Bra-Rad-SBP_{Amp}) may introduce error into central BP measurement but the magnitude of Bra-Rad-SBP_{Amp} in healthy people is uncertain. This study aimed to determine the magnitude of Bra-Rad-SBP_{Amp} as well as effects of ageing.
Methods: Forty healthy younger (28±5 years; 50% male) and 20 older (60±8 years; 50% male) participants underwent brachial and radial artery ultrasound measurement to identify SBP (1st Korotkoff sound) from the 1st Doppler flow inflection point during BP cuff deflation. Regional and local haemodynamics were recorded by ultrasound and tonometry. Bra-Rad-SBP_{Amp} was calculated by radial minus brachial SBP.
Results: Radial SBP was significantly higher than brachial SBP in both younger (118±12mmHg versus 110±10mmHg; $p<0.001$) and older (135±12mmHg versus 121±11mmHg; $p<0.001$) participants. However, the magnitude of Bra-Rad-SBP_{Amp} was higher in older age (14±7mmHg versus 8±7mmHg; $p=0.004$), and this was independent of heart rate, mean arterial pressure and sex. A higher proportion of older participants had major (>15mmHg) Bra-Rad-SBP_{Amp} (45% versus 12.5%; $p=0.028$). Recalibration of radial waveforms using radial versus brachial SBP resulted in higher central SBP in both younger ($p<0.001$) and older ($p<0.001$) age groups ($p<0.001$ between groups). Brachial artery stiffness was related to Bra-Rad-SBP_{Amp} in females only.
Conclusions: Major Bra-Rad-SBP_{Amp} occurs in healthy people and is significantly increased with age. These findings have implications for correct central BP estimation using radial tonometry and brachial BP calibration, whereby greater underestimation of central SBP is likely with advancing age.

P5.11
PHYSICAL FITNESS IMPROVEMENT AFTER CARDIAC REHABILITATION PROGRAM DEPENDS ON PWV

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Aortic pulse wave velocity (PWV) is a measure of vascular organ damage. After a cardiac event, patients can be proposed to follow an educational and exercise program to prevent future events and improve their cardiovascular risk. We hypothesized that the improvement of aerobic performance will depend on their initial arterial health measured with PWV.
126 patients (99men, 27 women) followed cardiac rehabilitation programs of Bellan Hospital in Paris. Programs duration lasted from 1 to 4 months.