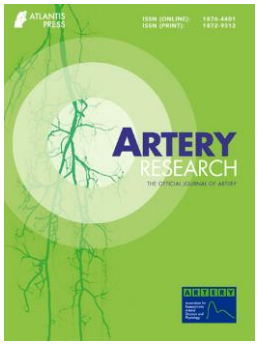

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PO-36: EFFECTS OF FIXED VERSUS AUTO-TITRATING CONTINUOUS POSITIVE AIRWAY PRESSURE ON VASCULAR FUNCTION IN PATIENTS WITH RESISTANT HYPERTENSION AND OBSTRUCTIVE SLEEP APNEA

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Introduction: Calcium intake, recommended for osteoporosis prevention, has been associated with cardiovascular (CV) outcomes. We examined the association of dietary calcium intake (dCa) with surrogate CV markers, including carotid intima-media thickness (cIMT), arterial stiffness and hemodynamics in healthy postmenopausal women.
Methods: Healthy postmenopausal women without any CV risk factors, from a randomized controlled trial studying the effect of calcium supplementation vs. dietary calcium on vascular heath, were recruited. Cross-sectional analyses of baseline data of the participants are presented. Peripheral systolic and diastolic blood pressures (pSBP, pDBP) were measured by BpTRU. cIMT of both common-carotid arteries was measured by B-mode ultrasonography (Philips-iU22). Arterial stiffness (carotid-to-femoral pulse wave velocity [cfPWV] and carotid-to-radial PWV), central SBP and DBP (cSBP, cDBP), mean arterial pressure (MAP), and hemodynamic parameters (pulse pressure, augmentation pressure, augmentation index corrected for 75 bpm) were obtained non-invasively (SphygmoCor). Usual dCa intake was estimated using a validated food frequency questionnaire. Measurements were compared across groups (<600, 600-1000 and >1000 mg/day of dCa) by one-way analysis of variance and covariance.
Results: We evaluated 83 postmenopausal women (mean age 60.4±6.3 years; BMI 25.6±3.8 kg/m^2). Mean dCa was 857±333 mg/day. Although within normal range, vascular parameters had a non-significant, U-shaped relationship with dCa. In unadjusted analyses, women with dCa >1000 mg/day had significantly higher cfPWV, pSBP, cSBP, and MAP compared to those with 600-1000 mg/day; however, significance was lost for all other parameters except for MAP after adjustment for pertinent covariates (Table).
Conclusion: In healthy postmenopausal women, a non-significant, U-shaped relationship of vascular parameters across the 3 dCa groups was noted; dietary calcium may have favourable effect on MAP for those consuming 600-1000 mg/day compared to >1000 mg/day intake. Of note, our population had optimal/normal BP. Our ongoing study including a larger sample-size will determine the relationship between dCa and surrogate CV markers.

PO-33
STATIN THERAPY IN RHEUMATOID ARTHRITIS MAY IMPROVE ARTERIAL STIFFNESS IN WOMEN BUT NOT IN MEN: A PRELIMINARY ANALYSIS

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Objectives: Patients with rheumatoid arthritis are at increased risk for cardiovascular disease. Statins have anti-inflammatory and immunomodulatory effects, thereby reducing cardiovascular risk. Arterial stiffness is a composite indicator of cardiovascular health and a predictor of cardiovascular risk. We assessed the effect of statin therapy on arterial stiffness and hemodynamics in subjects with rheumatoid arthritis.
Methods: A prospective cohort study including adults with rheumatoid arthritis and an indication for statin therapy (cases) or not (controls) is being conducted. Peripheral systolic and diastolic blood pressures were measured by BpTRU. Arterial stiffness (carotid-to-femoral pulse wave velocity [cfPWV] and carotid-to-radial PWV), central systolic and diastolic blood pressures, mean arterial pressure, and augmentation index corrected for 75 bpm were obtained non-invasively (SphygmoCor, AtCor, Australia). All measurements were performed prior to statin initiation and at 6-month post-treatment. Independent *t*-tests evaluated differences in changes between groups. Carotid intima-media thickness (cIMT) measurements were also performed.
Results: To date, 14 subjects (mean age 61.4±9.5 years, 9 females), have completed the study. All cases achieved recommended lipid level targets by 6 months. There were no statistical differences in patient characteristics (beyond lipid levels) at baseline or 6-months between cases and controls among the whole cohort. In sex-specific analyses, statin therapy was associated with a significant decrease in cfPWV in women taking statins compared to women in the control group (-0.71±0.18 m/s vs +0.96±1.13 m/s, respectively; p<0.05), which was not observed in men. No other associations were observed. cIMT analyses are underway.
Conclusion: Our preliminary results suggest that in women with rheumatoid arthritis, statin therapy may reduce cfPWV, a predictive marker of cardiovascular disease and events, which was not observed in men. Whether sex differences in the effect of statin on arterial stiffness are sustained with a larger sample size of rheumatoid arthritis patients will be addressed in our ongoing study.

PO-35
FIRST IN MAN MEASUREMENT OF ARTERIAL STIFFNESS USING A CONNECTED BATHROOM SCALE: CALIBRATION AGAINST SPHYGMOCOR

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Background: Measurement of arterial stiffness (AS) is still considered difficult. We developed a non- invasive technique to assess AS from a connected bathroom scale, based on ballistocardiography (BCG) and impedance plethysmography (IPG).
Methods: We included 192 subjects and patients, 106 for calibration study (cal), 86 for validation study (val), 33% hypertensives, mean age 48±17 years, 48% women. The scale pulse transit time (WS- PTT) was calculated as the difference between BCG systolic signals and IPG blood flow in the foot. Distance was estimated from body height and PWV was calculated. Carotid to femoral transit time (CF-PTT) was measured using SphygmoCor. Spearman and robust multivariate regressions were used.
Results: The WS-PTT correlated well with CF-PTT with R=0.73 in pooled population (cal 0.79, val 0.66). WS-PWV correlated with CF-PWV with R=0.76 (cal 0.80, val 0.70). The standard deviation of difference was 1.39 m/s with a bias of 0.25 m/s compared with CF-PWV. Correlations of WS-PWV with age and blood pressure were similar (R= 0.72 and 0.59, resp.) to those of CF-PWV (R=0.67 and 0.61, resp.). These good correlations were non-trivial given the differences in wave paths, the fact that measurements are made in orthostatic position and totally investigator-free.
Conclusion: We show in two distinct populations that a simple user-oriented instrument such as a connected bathroom scale can estimate arterial stiffness with accuracy close to healthcare-oriented systems. Because these devices will be used by the general population, the availability of arterial stiffness data on very large, non-medicalized populations will change our management of well-being and health.

PO-36
EFFECTS OF FIXED VERSUS AUTO-TITRATING CONTINUOUS POSITIVE AIRWAY PRESSURE ON VASCULAR FUNCTION IN PATIENTS WITH RESISTANT HYPERTENSION AND OBSTRUCTIVE SLEEP APNEA

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Introduction: Obstructive sleep apnea (OSA) is a common cause of resistant hypertension. We investigated the effects of 2 modalities of positive airway pressure; fixed continuous airway pressure (fCPAP) versus auto-titrating positive airway pressure (APAP) on arterial function in subjects with resistant hypertension and severe OSA.
Objective: To assess in participants with resistant hypertension and OSA the effects of fCPAP vs. APAP on 24h ambulatory blood pressure monitoring (ABPM), as well as sleep indices, heart rate variability (HRV), and arterial stiffness.
Methods: We randomized 14 subjects (56±11 years, baseline SBP and DBP 137±10 and 77±12 mm Hg, respectively, apnea-hypopnea index [AHI] 58±31 events/h, Epworth sleepiness scale 7±5) to fCPAP or APAP for 6 weeks, followed by crossover to the other modality for another 6 weeks. Overnight polysomnography, 24h ABPM, HRV, and carotid-femoral pulse wave velocity (cfPWV, arterial stiffness 'gold-

standard' measure) were measured at baseline and after each intervention period.
Results: fCPAP and APAP were associated with similar improvements in sleep quality, AHI and oxygen desaturation indices, while the nadir SpO_2 was significantly higher with fCPAP than APAP (z=-2.251, p=0.03). There were no significant effects of either modality on central BP or 24h ABPM, likely due to controlled BP at baseline. Both fCPAP and APAP improved cfPWV compared to baseline, (fCPAP, p=0.017; APAP, p=0.056), suggesting that their effects are BP independent. CPAP significantly decreased HR and HRV, whereas APAP had no effect.
Conclusions: No differences in vascular function was observed with treatment with fCPAP or APAP, but there is some suggestion that fCPAP is associated with improved measures of arterial health, i.e.: cfPWV and HR. The effects of fCPAP on arterial stiffness may be independent of BP and potentially mediated by changes in sympathovagal activity. Our results of mild favorable effects of fCPAP need to be confirmed in larger studies.

PO-37
THE IMPACT OF INTRADIALYTIC PEDALING EXERCISE ON ARTERIAL STIFFNESS IN A HEMODIALYSIS POPULATION

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Objectives: Hemodialysis patients are at greater risk of increased arterial stiffness. Regular aerobic exercise has been shown to reduce arterial stiffness in hemodialysis patients. However, the impact of a more realistic intradialytic form of exercise, such as pedaling, is unclear. Therefore, we aimed to examine 1) the effect of intradialytic pedaling exercise on arterial stiffness over 4 months, and 2) the durability of the pedaling effect 4 months after finishing the exercise intervention.
Methods: We performed a 4-month randomized control trial in patients on a stable in-center hemodialysis regimen (3 days/week). Subjects were block randomized to either pedaling exercise (EX) or to a control group receiving usual dialysis (nonEX) for 4 months. At baseline and 4 months, augmentation index heart rate corrected (AIx75), and carotid-femoral pulse wave velocity (cfPWV) were assessed (applanation tonometry; SphygmoCor XCEL). Measurements were repeated in the EX group 4 months after the exercise intervention.
Results: 11 exercisers (58±16 years, BMI 26±5kg/m^2, 3 female) and 10 controls (53±15 years, BMI 27±6kg/m^2, 3 female) were included. Overall exercise compliance was 60±25%, and subjects exercised on average 47±25 mins per session. AIx75 was unchanged in the EX group, however an increase of 4.4±4.5% was noted in the nonEX group (*P=0.020*). We observed a greater absolute decrease in cfPWV in the EX group compared to the nonEX group: -1.44±2.06 vs. 0.27±0.55 m/s (*P=0.037*) (Figure 1). This difference in cfPWV was maintained after adjustments for age, Charlson comorbidity score, and the baseline cfPWV value (*P=0.041*). Interestingly, the decrease in cfPWV observed in the EX group was partially preserved 4 months after exercise cessation (Figure 2).
Conclusions: The relationship between intradialytic pedaling exercise and improved arterial stiffness is promising, and warrants further investigation. Moreover, we have demonstrated that pedaling exercise is a realistic form of aerobic training in hemodialysis patients.

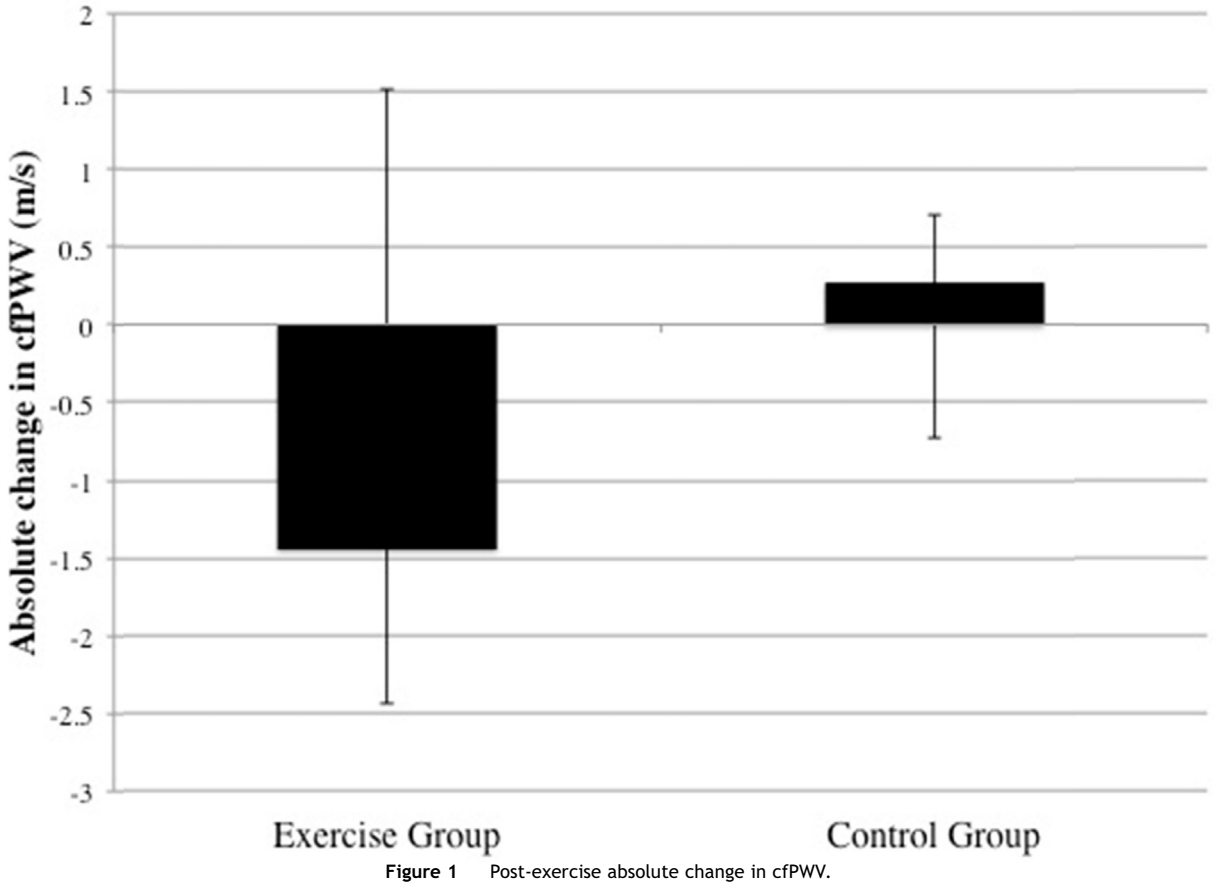

Figure 1 Post-exercise absolute change in cfPWV.