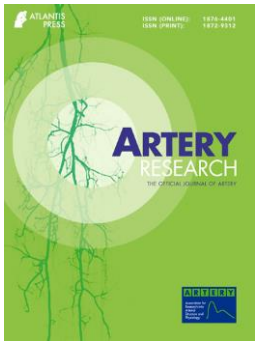

Artery Research

ISSN (Online): 1876-4401 **ISSN (Print): 1872-9312**
Journal Home Page: https://www.atlantis-press.com/journals/artres

3.2: LOCAL ARTERIAL STIFFNESS ASSESSED BY ECHO TRACKING IS NOT ASSOCIATED WITH AN INCREASED PULSE WAVE VELOCITY IN HYPERCHOLESTEROLEMIC RABBIT

M. Isabelle, C. Ragonnet, S. Chimenti, C. Badier-Commander, C. Vayssettes-Courchay, N. Villeneuve, J.-P. Vilaine

To cite this article: M. Isabelle, C. Ragonnet, S. Chimenti, C. Badier-Commander, C. Vayssettes-Courchay, N. Villeneuve, J.-P. Vilaine (2013) 3.2: LOCAL ARTERIAL STIFFNESS ASSESSED BY ECHO TRACKING IS NOT ASSOCIATED WITH AN INCREASED PULSE WAVE VELOCITY IN HYPERCHOLESTEROLEMIC RABBIT, Artery Research 7:3_4, 165–165, DOI: https://doi.org/10.1016/j.artres.2013.10.015

To link to this article: https://doi.org/10.1016/j.artres.2013.10.015

Published online: 14 December 2019

hour. Therefore, a fee for service to measure central BP of approximately $30 could be both economically and financially justifiable.
Conclusions. Management of hypertension using central BP has cost-savings relating to decreased medication and may be regarded as cost-neutral when factoring in a fee for central BP measurement.

Oral Session 3

Young Investigator Oral Presentations

In association with the European Society of Hypertension Working Group on Vascular Structure and Function

3.1
OUTCOME-DRIVEN THRESHOLDS FOR AMBULATORY PULSE PRESSURE IN 9938 PEOPLE RECRUITED FROM 11 POPULATIONS

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Background. Evidence-based thresholds for risk stratification based on pulse pressure (PP) are currently unavailable.
Methods. To derive outcome-driven thresholds for the 24-h ambulatory PP, we analyzed 9938 people randomly recruited from 11 populations (47.3% women). After age stratification (<60 *vs.* ≥60 years) and using average risk as reference, we computed multivariable-adjusted hazard ratios (HRs) to assess risk by tenths of the PP distribution or risk associated with stepwise increasing (+ 1 mm Hg) PP levels.
Results. Among 6028 younger participants (68,853 person-years), the risk of cardiovascular (HR, 1.58; $P = 0.011$) or cardiac (HR, 1.52; $P = 0.056$) events increased only in the top PP tenth (mean, 60.6 mm Hg). Using stepwise increasing PP levels, the lower boundary of the 95% confidence interval of the successive thresholds did not cross unity. Among 3910 older participants (39,923 person-years), risk increased ($p \leq 0.028$) in the top PP tenth (mean, 76.1 mm Hg). HRs were 1.30 and 1.62 for total and cardiovascular mortality, and 1.52, 1.69 for all cardiovascular, cardiac events. The lower boundary of the 95% confidence interval of the HRs associated with stepwise increasing PP levels crossed unity at 64 mm Hg. While accounting for all covariables, the top tenth of PP contributed less than 0.3% (generalized R^2 statistic) to the overall risk among elderly.
Conclusions. In randomly recruited people, ambulatory PP does not add to risk stratification below age 60; in the elderly, PP is a weak risk factor with levels below 64 mm Hg probably being innocuous.

3.2
LOCAL ARTERIAL STIFFNESS ASSESSED BY ECHO TRACKING IS NOT ASSOCIATED WITH AN INCREASED PULSE WAVE VELOCITY IN HYPERCHOLESTEROLEMIC RABBIT

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Arterial stiffness (AS) is generally measured by regional arterial pulse wave velocity (rPWV) or locally by arterial distensibility. Although often used interchangeably, some studies show a weak correlation between these well accepted AS index depending on population. Thus, we aim to investigate in an experimental model of hypercholesterolemic rabbit the comparison between arterial pulse wave velocity and local arterial distensibility. Male New Zealand rabbits (8 week-old) received diet with 0.3% cholesterol for 17 weeks. Under anaesthesia, rPWV was measured with catheters between ascending aorta and illiac artery by the foot-to-foot method. Local arterial stiffness was assessed by echotracking with local PWV using the Moens-Korteweg equation $= (1.050xD)^{-1/2}$, from distensibility as $D = A/AxP$ at different sites: carotid (cPWV), aorta (aPWV and femoral (fPWV). Vessel lesions were analysed by fat red staining.
Table 1 presents the results. As expected, local PWV is comparable in elastic arteries (carotid and aorta) and higher in muscular arteries (femoral artery). Surprisingly, we observe no modification of rPWV and cPWV between the two groups. However, local aPWV and fPWV are increased in hypercholesterolemic rabbits. Only a correlation between the rPWV and local aPWV was observed in control rabbits ($r^2=0.76$ $P = 0.02$). Vessel plaques are more important in aorta and femoral artery than in carotid artery. In conclusion, in a rabbit model of atherosclerosis, we observe an increase in local arterial stiffness in aorta and femoral artery associated with plaques. However, this local stiffening seems to have a weak impact on regional PWV.

Table 1

	rPWV (m/s)	cPWV (m/s)	aPWV (m/s)	fPWV (m/s)
Control	5.0 ± 0.2	6.6 ± 0.4	5.9 ± 0.2	18.8 ± 1.2
Hyperchol	4.9 ± 0.2	6.7 ± 0.4	6.9 ± 0.3 *	25.9 ± 1.8 *

3.3
TOTAL ARTERIAL ELASTANCE IS MORE STRONGLY ASSOCIATED WITH CARDIOVASCULAR DISEASE THAN CAROTID-FEMORAL PULSE WAVE VELOCITY

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Background. Arterial stiffness is associated with an increased risk of cardiovascular disease (CVD) and carotid-femoral pulse wave velocity (cfPWV) is considered as the 'gold standard' measurement method. However cfPWV does not assess the stiffness of the proximal aorta and its sensitivity at higher levels of arterial stiffness, such as in the elderly, has been questioned. We compared associations between CVD and cfPWV and total arterial elastance (TAE) in a cohort of elderly individuals.
Methods. 961 individuals (69±6yrs; 76% male) underwent echocardiography (Philips iE33), cerebral MRI, cfPWV (Pulse Trace) and central blood pressure (Pulsecor) measurements. Central pulse pressure and stroke volume were used to calculate TAE. Coronary heart disease (CHD) was defined as a coronary event or revascularisation identified by medical record review, and adjudicated by an independent committee. Cerebrovascular disease was defined as those with infarcts (2+) on MRI or adjudicated history of stroke. Associations are presented as odds ratios (OR) [95% confidence intervals] by logistic regression.
Results. A modest correlation was observed between cfPWV and TAE (spearman's rho = 0.14). Associations with CVD were stronger for TAE than cfPWV and subdividing participants based on cfPWV had little effect on associations (Table).

Table. Association of cfPWV and TAE with CHD and cerebrovascular disease (adjusted for age, sex and ethnicity). Individuals were also subdivided into two groups based on their cfPWV.

	All participants $n=961$		PWV < 12 ms^{-1} $n = 643$		PWV ≥ 12 ms^{-1} $n = 318$	
	OR [95%CI]	*P*	OR [95%CI]	*P*	OR [95%CI]	*P*
CHD						
cfPWV	1.05 [1.01,1.09]	0.03	1.06 [0.93,1.21]	0.4	1.05 [0.97,1.10]	0.2
TAE	2.15 [1.34—3.45]	0.002	2.11 [1.14, 3.91]	0.02	2.00 [0.93,4.30]	0.07
Cerebro-vascular disease						
cfPWV	1.04 [0.99,1.08]	0.1	0.99 [0.88,1.12]	0.9	1.01 [0.93,1.10]	0.8
TAE	1.40 [0.86-2.26]	0.2	1.54 [0.85,2.80]	0.2	1.12 [0.49,2.59]	0.8