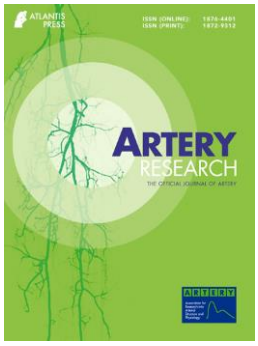

Artery Research

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

01.02: ARTERIAL STRUCTURE AND FUNCTION AND ENVIRONMENTAL EXPOSURE TO CADMIUM

R. Schutte, T. Nawrot, T. Richart, L. Thijs, H.A. Roels, L.M. Van Bortel, H. Struijker-Boudier, J.A. Staessen

To cite this article: R. Schutte, T. Nawrot, T. Richart, L. Thijs, H.A. Roels, L.M. Van Bortel, H. Struijker-Boudier, J.A. Staessen (2007) 01.02: ARTERIAL STRUCTURE AND FUNCTION AND ENVIRONMENTAL EXPOSURE TO CADMIUM, Artery Research 1:2, 47–47, DOI: https://doi.org/10.1016/j.artres.2007.07.037

To link to this article: https://doi.org/10.1016/j.artres.2007.07.037

Published online: 21 December 2019

Artery Research (2007) 1, 47–76

available at www.sciencedirect.com

ScienceDirect

journal homepage: www.elsevier.com/locate/artres

Abstracts of Artery 7, Prague, Czech Republic 14–15 September 2007

Young Investigator Presentations

01.01
ARTERIAL STIFFNESS IS INCREASED IN PAEDIATRIC HEART RECIPIENTS

E. Sharkey [1], A. Klinge [1], J. Allen [1], A. Murray [1], R. Kirk [1], J. O'Sullivan [1,2]. [1]*University of Newcastle upon Tyne, Newcastle-Upon-Tyne, United Kingdom,* [2]*Freeman Hospital, Newcastle-Upon-Tyne, United Kingdom*

Introduction: Hypertension is a common complication following paediatric heart transplantation. One potential important factor is arterial stiffness, which has been shown to increase the risk of cardiovascular disease in adults.
Aim: To compare measures of arterial stiffness between paediatric heart transplant recipients (HTR) and healthy children.
Methods: Height, weight and blood pressure were measured in 191 healthy children (5–15 years) and 27 HTR (ages 6–18 years). Peripheral pulses were recorded at the ears, fingers and toes using multi-site photoplethysmography technology. Pulse transit times (PTT) and their differences between sites were calculated as indicators of arterial stiffness. ANCOVA statistical analysis was used to assess differences between the subject groups.
Results: ANCOVA analysis, with adjustments for differences in physical variables, demonstrated that measurements were significantly shorter in the HTR compared to normals for absolute toe PTT (300 ms vs. 312 ms, $p=0.009$) and the differences in toe PTT compared with ear (150 ms vs. 177 ms, $p<0.001$) and finger (101 ms vs. 121 ms, $p<0.001$). In addition, this study also found that HTR had significantly higher diastolic blood pressure (DBP) (69 mmHg vs. 63 mmHg, $p=0.034$) and heart rates (91 bpm vs. 78 bpm, $p=0.001$).
Conclusion: This study shows that heart transplant recipients have significantly shorter PTT than normal subjects. This suggests they have stiffer arteries, which probably contributes to their systolic hypertension. When considered alongside differences in DBP, it would appear that hypertension in HTR is multi-factorial.

01.02
ARTERIAL STRUCTURE AND FUNCTION AND ENVIRONMENTAL EXPOSURE TO CADMIUM

R. Schutte [1], T. Nawrot [1], T. Richart [1], L. Thijs [1], H.A. Roels [2], L.M. Van Bortel [3], H. Struijker-Boudier [4], J.A. Staessen [1]. [1]*University of Leuven, Leuven, Belgium,* [2]*Université catholique de Louvain, Brussels, Belgium,* [3]*Ghent University, Ghent, Belgium,* [4]*Maastricht University, Maastricht, Netherlands*

Background: Controversy exists regarding cadmium's influence on arterial function at the population level.
Methods and results: The associations of cadmium with measures of arterial function were determined in a randomly selected population sample ($n=557$) from two rural areas with low and high environmental exposure to cadmium. 24-h urinary cadmium excretion was significantly higher in the high compared with the low exposure group ($P<0.0001$). Aortic pulse wave velocity ($P=0.008$), brachial pulse pressure ($P=0.026$) and femoral pulse pressure ($P=0.008$) were significantly lower in the high exposure group. Femoral distensibility ($P<0.0001$) and compliance ($P=0.0013$) were significantly higher at high exposure. By determining associations between measures of arterial function and cadmium exposure across quartiles of the 24-h urinary cadmium excretion (adjusted for sex and age), brachial (P for trend $=0.015$) and femoral (P for trend $=0.018$) pulse pressure significantly decreased and femoral distensibility (P for trend $=0.008$) and compliance (P for trend $=0.007$) significantly increased with high cadmium excretion. After full adjustment, the partial regression coefficients confirmed these associations. Pulse wave velocity ($\beta=-0.79$; $P=0.004$) and carotid ($\beta=-4.20$; $P=0.006$), brachial ($\beta=-5.43$; $P=0.0001$) and femoral ($\beta=-4.72$; $P=0.007$) pulse pressures correlated negatively, while femoral compliance ($\beta=0.11$; $P=0.016$) and distensibility ($\beta=1.70$; $P=0.014$) correlated positively with cadmium excretion.
Conclusions: Increased cadmium body burden is associated with lower aortic pulse wave velocity, lower pulse pressure throughout the arterial system, and higher femoral distensibility.

01.03
CAROTID PLAQUE, ARTERIAL STIFFNESS GRADIENT, AND BENDING STRAIN IN HYPERTENSION

H.B. Beaussier, I.M. Masson, C.C. Collin, E.B. Bozec, B.L. Laloux, P.B. Boutouyrie, S.L. Laurent. *INSERM URMS 872, Paris, France*

Background: Plaque rupture may involve shearing strain of the arterial wall in the longitudinal direction. We previously determined a longitudinal gradient of arterial strain, named bending strain (BS), along the common carotid artery (CCA), with two distinct patterns (Paini et al. Stroke 2007): Pattern A (outward BS; larger radial strain at the plaque level than adjacent CCA) and Pattern B (inward BS), more often observed in dyslipidemic and type 2 diabetic patients.
Aim: To determine the influence of essential hypertension on patterns of bending strain.
Method: 92 patients with an atherosclerotic plaque on the CCA were included: 66 patients with essential hypertension (HT), either treated or not, and 26 normotensives (NT). A novel non-invasive echotracking system (ArtLab®) was used to measure intima-media thickness, diameter, pulsatile strain, and distensibility at 128 sites on a 4 cm long CCA segment.
Results: NT and HT did not differ except for BP values and an older age (5 years). Pattern A was less frequently observed in HT than in NT. The plaque exhibiting Pattern A were characterized by an inward remodeling whereas plaques exhibiting Pattern B grew according to an outward remodeling (increased external diameter and no change in internal diameter). In multivariate logistic regression analysis, Pattern B was influenced by essential hypertension (OR=6.8[1.35-34.9], $P<0.02$), independently of outward remodeling (OR=4.6[1.6-13.4], $P<0.005$) and lack of RAAS inhibitors (OR=4.7[1.1-20.4], $P<0.05$).
Conclusion: Patients with essential hypertension had a stiffer carotid at the level of the plaque than in adjacent CCA, leading to an inward bending stress.

1872-9312/$ – see front matter
doi:10.1016/j.artres.2007.07.005