

Regional arterial stiffness assessed by pOpmètre® in patients with carotid plaques.

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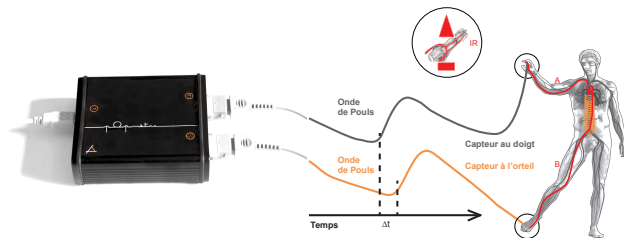
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Objective: Pulse wave velocity (PWV), an index of arterial stiffness, is mainly related to arterial ageing in the aorta and the lower limbs but not in the upper limbs. Arterial ageing can be easily evaluated by the pulse wave transit time (TT) between the finger (TTf) and the toe (TTt) using **pOpmètre®** - Axelife sas - France - a new device to determine arterial stiffness. The aim of the study was to evaluate the relationship between the **pOpmètre®** indices and 1. the presence of carotid plaques, 2. ageing.

Methods: Measurements were performed on 77 consecutive patients with cardiovascular risk factors attending vascular examinations. The difference (Dtf) between TTt and TTf was calculated. Based on height charts, the toe to finger PWV (PWVtf = height * k / Dtf) and the **pOpscore®** (= PWVtoe / PWVfinger) was calculated.

Carotid plaques & intima-media thickness (IMT) was assessed by standard Doppler ultrasound scans. The local aortic stiffness (AoStiff) was measured by an impedance system (Eorta, Manatec Biomedical). Ankle Brachial Pressure Index (ABPI) is measured as a known marker of cardiovascular risk factor.



	Carotid plaques		P
	Presence	Absence	
pOpmètre® indices:	N = 25	N = 52	
DTF (m/s)	57.9 ± 5.1	73.5 ± 3.5	<0.01
pOpscore®	1.51 ± 0.03	1.41 ± 0.02	<0.006
PWVtf (m/s)	14.3 ± 1.0	10.7 ± 0.7	<0.004
AoStiff	10.4 ± 0.7	8.2 ± 0.5	<0.02
IMT (mm)	0.69 ± 0.02	0.63 ± 0.01	<0.004
PAS (mm Hg)	137.0 ± 3.4	132.0 ± 2.4	ns
PAD (mm Hg)	87.0 ± 2.7	82.0 ± 1.9	ns
ABPI	1.15 ± 0.04	1.12 ± 0.03	ns

Results: Forty five men and 32 women aged ((mean ± SEM) 54 ± 2 vs 50 ± 2 years, ns) with high Body Mass Index (29.7 ± 1.4 vs. 29.2 ± 0.9 kg/m², ns) were evaluated. Twenty three had hypercholesterolemia, 22 were smokers, 26 hypertensive and 9 had type 2 diabetes. Patients with carotid plaques (see table, n = 25) were older (58 ± 2 vs 49 ± 2, p <0.002) with a larger IMT and AoStiff. They had a shorter Dtf with a greater **pOpscore®** and PWVtf, but no difference were found in ABPI, systolic or diastolic BP. Age correlated with AoStiff (r² = 0.15, p = 0.002), IMT (r² = 0.17, p = 0.0003), Dtf (r² = 0.28, p<10⁻⁴), pOpscore (r² = 0.19, p<10⁻⁴), PWVtf (r² = 0.24, p<10⁻⁴), not with ABPI, but with systolic (r² = 0.11) and diastolic (r² = 0.91) blood pressure.

Conclusion:

Arterial stiffness indices measured by pOpmètre® in the peripheral vasculature are linked with subclinical atherosclerosis (i.e. carotid plaques), and are correlated with ageing.