**Methods** — This study was performed in 169 French males over 60 years. Aortic stiffness was assessed by carotid/femoral pulse wave velocity (PWV). BMD and body composition were determined with a DEXA device in lumbar spine L1-L4, femoral neck and total body.

**Results** — Lean mass was positively correlated with the three T-scores accounting for 11.6%, 26.6% and 12.2% of the variability in lumbar spine L1-L4, femoral neck and total body BMD. Fat mass had no effect on BMD. However, fat mass was positively correlated with aortic PWV accounting for 9.8% of its variability. Lean mass was not a determinant of PWV. Hypertension, diabetes and dyslipidemia were associated with higher PWV but had no effect on BMD.

**Conclusions** — In males from a general population over 60 years of age, bone and arterial aging are differently influenced by lean and fat mass. Our results indicate that elderly men with high lean mass and low fat mass exhibit the best arterial and bone profile, with the lowest arterial stiffness and the highest BMD.

**Abstracts**

**I029**

**THE REGULATION OF LARGE ARTERY STIFFNESS BY THE VASCULAR ENDOTHELIUM INCLUDES THE CONTROL OF ARTERIAL WALL VISCOSITY**

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Although the viscoelasticity of large arteries has been extensively investigated, few studies have focused on arterial wall viscosity (AWV) itself and its regulation by the endothelium in vivo. This is of particular importance since AWV is a major source of energy dissipation through the vascular system reducing the efficiency of cardiovascular coupling.

We simultaneously measured in 8 healthy volunteers (age: 22±1 years) radial artery diameter and arterial pressure (NIUS02) before and after 8 min local infusion of L-NMMA (8 mmol/min) as NO-synthase inhibitor, tetraethylammonium (TEA: 9 mmol/min), as blocker of calcium-activated potassium channels, the target of endothelium-derived hyperpolarizing factors (EDHF), and L-NMMA+TEA. Arterial pressure and diameter were carefully synchronized and the pressure-diameter relationship were constructed at each cardiac cycle. AWV was estimated from the ratio of the area of the hysteresis loop of the pressure-diameter relationship to the area representing the whole energy exchanged during each cardiac cycle (figure). Radial artery stiffness was evaluated during the whole cardiac cycle by the calculation of cross-sectional distensibility and during the ventricular ejection period by the slope of the ascending loop.

L-NMMA did not modify significantly arterial distensibility and ascending slope but, paradoxically increased AWV (from 29.5±0.7 to 24.9±0.7, P<0.05). Conversely, TEA reduced arterial distensibility (from 6.50±0.19 to 5.3±0.3 10^-5 kPa, P<0.002) and the ascending slope (from 1.03±0.01 to 0.86±0.03 mm.mmHg, P<0.001) and increased AWV (from 29.1±0.7 to 35.0±0.7, P<0.04). The combination of L-NMMA+TEA induced a more marked decrease in distensibility (from 6.86±0.24 to 4.85±0.17 10^-5 kPa, P<0.001) and ascending slope (from 1.06±0.04 to 0.69±0.03 mm.mmHg, P<0.001) and increase in AWV (from 29.0±0.9 to 43.0±0.7, P=0.04) as compared with TEA alone (all P<0.05).

These results demonstrate in vivo in humans that the vascular endothelium contributes, in addition to large artery elasticity, to the regulation of AWV through the release of NO and EDHF.

**I030**

**YOUNG SPONTANEOUSLY HYPERTENSIVE RATS (SHR) WITH CHRONIC INHIBITION OF NITRIC OXIDE EXHIBIT SIMILAR AORTIC STIFFNESS TO OLD SHR**

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The old spontaneously hypertensive rat (SHR) is known to be a good experimental model that is highly analogous to essential hypertension in man but is costly and time consuming. Chronic inhibition of nitric oxide (NO) production in young adult SHR is an experimental model of malignant hypertension and chronic renal disease, very similar to old SHR. Considering that acute or chronic decreases in NO production in normotensive rats increase arterial stiffness, we aimed to compare the aortic stiffness between SHR/L-NAME and old SHR.

Male SHR (18 weeks old) received N-Nitro-L-Arginine Methyl Ester (L-NAME) 6 mg/kg/d in drinking water (SHR/L-NAME) for 2 weeks and were compared to SHR and Wistar Kyoto rats (WKY). Moreover, two groups are composed of 55 weeks aged SHR (Old SHR) and WKY (Old WKY). Under anesthesia, two catheters were introduced in the left common carotid artery and the left femoral artery to measure central and peripheral blood pressure and assess aortic stiffness with pulse wave velocity (PWV= distance between the tips of the two catheters / transit time), β-index (2.11x(PWV^2/Diastolic blood pressure)), amplification and pulse pressure (PP).

At 20 weeks, although SHR have higher central systolic blood pressure (SBP) than WKY (201±7 mmHg vs. 154±4 mmHg), no significant difference in PWV, PP, amplification and β-index was observed between these two groups. With age, old WKY have higher SBP (181±8 mmHg) and higher PWV (6.7±0.5 m/s) and β-index (0.70±0.08) than young WKY. Old SHR exhibit higher SBP (252±13 mmHg), PWV (9.3±0.7 m/s), PP (71±7 mmHg), β-index (1.08±0.16) than old WKY and young SHR (PWV=6.2±0.2 m/s, PP=39±3 mmHg and β-index=0.50±0.03). Young SHR, after 2 weeks of L-NAME administration, have higher SBP (238±10 mmHg) and aortic stiffness (PWV=8.6±0.6 m/s, PP=54±6 mmHg and β-index=0.89±0.14) than young SHR and possess the aortic stiffness observed in old SHR.
In conclusion, our results indicate a close analogy in arterial stiffness between SHR/L-NAME and old SHR. Thus, this experimental model shows similarities to hypertensive humans and appears relevant to test new anti-hypertensive treatments.


I031
AORTA DILATATION AND ARTERIAL REMODELLING IN PATIENTS WITH FABRY DISEASE UNDER ENZYME REPLACEMENT THERAPY

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Purpose — Fabry disease is a deficiency of lysosomal enzyme α-galactosidase A leading to accumulation of glycosphingolipids in cardiac and vascular tissues. Although enzyme replacement therapy decreases glycosphingolipids storage in tissues, we have described a continuous vascular hypertrophy whereas the aortic stiffness was paradoxically decreasing under long-term enzyme therapy. Preliminary results reported that Fabry’s aorta diameters under treatment were more dilated in comparison to control group. The objective of this study is to determined parallelism between presumed aorta dilatation, aortic stiffness and arterial remodeling in treated Fabry patients.

Methods — 41 treated patients were enrolled (38±12 yrs) with arterial measurements of a) radial and carotid intima-media thickness, diameter, local pulse pressure and distensibility obtained with echotracking device; b) aortic stiffness obtained through carotid to femoral pulse wave velocity with tonometry and c) aorta diameters (sinus, ascending and descending tubule, arch aortic) assessed by magnetic resonance imaging examinations.

Results — Pulse wave velocity was positively correlated with ascending and descending aorta tubules diameters in univariate analysis (respectively R²=0.13, P<0.05; R²=0.11, P<0.05) and after adjustment on body surface area, pulse pressures ratio and hypertension (respectively P<0.05 and P=0.01). Aorta diameters (ascending, descending tubule and arch aortic) were positively correlated with carotid diameter (respectively R²=0.44, P<0.0001, R²=0.32, P=0.0001 and R²=0.34, P=0.0001) and after adjustment as previously (respectively P=0.0001, P=0.05 and P<0.001). No correlations were found among all aorta diameters and radial diameter and between aorta sinus and carotid and radial artery properties. Carotid stiffness was positively correlated with ascending, descending tubules and arch aortic diameters (respectively R²=0.38, P<0.0001; R²=0.29, P<0.0005 and R²=0.23 P<0.005) and after adjustments as previously adding pulse wave velocity (P<0.0001, P<0.0005 and P<0.01).

Conclusion — this study underlies interrelation between aortic diameters, aortic stiffness, elastic and muscular arteries geometry and carotid stiffness in patients with Fabry disease under enzyme therapy.

I032
L’EFFET PRÉVENTIF DU TRAITEMENT ANTIHYPERTENSEUR SUR LES ACCIDENTS VASCULAIRES CÉRÉBRAUX ET CORONAIRES VARIE AU COURS DU TEMPS ET SELON LA NATURE DU TRAITEMENT

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Introduction — La base INDANA est une méta-analyse de données de patients hypertendus issus d’études comparant le traitement antihypertenseur (TH), diurétique ou bêtabloquant, au placebo. Des analyses précédentes ont montré que l’effet préventif du TH, sans prise en compte de sa nature, sur les accidents coronariens (AC) et sur les accidents vasculaires cérébraux (AVC) variait dans le temps. L’effet du TH sur le risque d’AC est immédiat et diminue ensuite au cours du temps, alors que l’effet sur le risque d’AVC se renforce au cours du temps. Dans ce travail nous avons étendu l’analyse de la variation de l’effet dans le temps en prenant en compte la nature du TH de première intention : diurétique ou bêtabloquant.

Méthode — Nous avons considéré les études ayant utilisé en première intention un traitement diurétique (20782 patients), ou bêtabloquant (17225 patients). Les critères de jugement étaient les AVC et les AC. Nous avons découpé les 5 premières années de suivi en intervalles d’un an et utilisé un modèle de Poisson multivarié avec un ajustement sur le TH, le temps, l’âge, le sexe, l’étude, ainsi que les interactions d’intérêt.

Résultats — L’effet des diurétiques sur les AVC apparaît au cours de la deuxième année et augmente au cours du temps (interaction non significative, HR = 0.89 [0.78 — 1.02]), sans différence entre les sexes. L’effet des bêtabloquants apparaît au cours de la 3e année et augmente au cours du temps (interaction significative, HR = 0.81 [0.7-0.94]), sans différence entre les sexes. L’effet des diurétiques sur les AC est significatif (HR = 0.81 [0.70-0.94]) sans interaction avec le temps ou avec le sexe. L’effet des bêtabloquants diminue dans le temps (interaction non significative, HR = 1.12 [1 — 1.26]) avec un effet délétère non significatif chez les femmes.

Conclusion — La dynamique de prévention du TH est différente sur les AC et les AVC. Concernant les AC, diurétiques et bêtabloquants ont un profil d’action dans le temps très proche. Concernant les AC, la diminution de l’effet protecteur dans le temps semble être liée aux bêtabloquants qui seraient moins protecteurs, en particulier chez les femmes.