P8.08: HEMODYNAMICS AND LARGE ARTERY STIFFNESS IN YOUNG PREHYPERTENSIVE MEDICAL STUDENTS

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Objective: Which are aortic pulse wave velocity determinants in a diabetic population?

Methods: We studied 132 diabetic patients. They entered the day hospital to have their aorta measured. We measured brachial and central blood pressure, augmentation index, and pulse wave velocity (PWV). They also had extended biochemical tests.

Results: Among those 132 patients, 8% had type 1 diabetes and 92% had type 2 diabetes. Mean period of diabetes was 13 years. Treatments combined insulin (47%), biguanids (54%), acarbose (10%), sulfamids (31%), thiazolidinediones (11%), with 25 patients (19%) having both insulin and oral drugs. We compared patients with and without insulin, measured their PWV, and adjusted it to standard factors (age, gender, MAP, sex), but also to 3 time-related diabetes criteria (short term: plasma glucose; middle term: HbA1c; long term: insulin treatment).

Antihypertensive drugs such as ACEI also contribute to the model (-1.02; p < 0.02).

Conclusion: Insulin treatment is the most powerful diabetes-related parameter accepted in this PWV model. Oral hypoglycemic drugs, HbA1c, plasma glucose do not contribute to the PWV model. RAAS blockade drugs contribute to the PWV model.

Diabetes control quality over the time when coming to the point of having insulin as a treatment is an independent factor of arterial wall rigidification.

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HEMODYNAMICS AND LARGE ARTERY STIFFNESS IN YOUNG PREHYPTERTENSIVE MEDICAL STUDENTS
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Background: Prehypertensive subjects have a markedly increased risk of developing hypertension compared to normotensive subjects. Prehypertension is therefore an excellent model to study hemodynamics and arterial stiffness in the development of hypertension.

Methods: We assessed hemodynamics and arterial stiffness in normotensive (NT, blood pressure <120/80 mmHg) and prehypertensive (PHT, blood pressure 120-139/80-89 mmHg) medical students. Blood pressure (BP) was measured with a validated oscillometric device on two separate visits. On a third visit cardiac output, cardiac index (cardiac output corrected for body surface area), stroke volume and heart rate were measured using the Nexfin monitor for continuous non-invasive finger BP monitoring. Carotid-femoral pulse wave velocity (cfPWV) was measured using the Sphygmocor system.

Results: We studied 15 prehypertensive subjects (BP 127 ± 8/69 ± 6 mmHg, 13 males, age 21.5 ± 2 years) and 25 normotensive subjects (BP 112 ± 7/64 ± 6 mmHg, 8 males, age 21.1 ± 3.6 years). Nexfin data were available for 31 subjects (22 NT and 9 PHT). Cardiac output and cardiac index were 7.0 ± 1.2 and 3.6 ± 0.7 L/min respectively in prehypertensive compared to 5.7 ± 0.9 and 3.1 ± 0.4 L/min in normotensive subjects (p = 0.002, p = 0.02). Stroke volume was 111 vs 101 ml (p = 0.13) and heart rate was 65 vs 57 bpm (p = 0.06). cfPWV was higher in the prehypertensive group (5.5 ± 0.5 vs. 5.2 ± 0.5 m/s p < 0.03). Linear regression analysis showed that age (R² = 0.13, β = 0.39, p = 0.02) and SBP (R² = 0.28, β = 0.53, p = 0.001) are independent determinants of cfPWV.

Conclusion: Young prehypertensive medical students have higher cardiac output and cardiac index than normotensive students. The increased cfPWV in the prehypertensive subjects is partially determined by higher blood pressures.