Cigarette smoking abolishes the Mediterranean diet benefit on exercise capacity, coronary physiology and target organ damage in hypertensive males with erectile dysfunction

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Background: Erectile dysfunction (ED) often coexists impairing quality of life in the hypertensive aging male population. The Mediterranean diet (Med-diet) benefits cardiovascular health. Coronary flow reserve (CFR) displays the ability of the coronary circulation to increase flow. Central vascular stiffness and microalbuminuria (UMALb) represent hypertension-related target organ damage (TOD).

Purpose: To investigate cigarette smoking adverse effects on the Med-diet benefit in exercise capacity, coronary physiology and TOD in hypertensive males with ED.

Methods: We enrolled 290 hypertensive ED males (mean age: 57 yo) with no history of diabetes mellitus or overt cardiovascular disease. 121 (42%) were current cigarette smokers. Intensity of smoking referred in packs/year. All underwent a treadmill stress test (Bruce protocol), exercise capacity was validated as metabolic equivalents (METs). We measured the CFR of the LAD artery (2D echo) by performing an adenosine protocol (max dose 140μg/Kg/min over 6 min). PW Doppler measurements were achieved at the middle/distal LAD (color Doppler flow mapping). CFR was validated as ratio between peak diastolic flow velocity following drug infusion and rest. Ratios ≥2 indicate macro and microvascular coronary integrity. Participants were screened for the presence of UMALb (urinary albumin loss 30 – 300 mg/24 h urine volume collection). Finally a non-invasive evaluation of the carotid–femoral pulse wave velocity (PWV), estimation of central pressures and augmentation index (AIx) a parameter of wave reflection amplification were performed (Sphygmocor device). ED severity and the Med-diet adherence were assessed by the SHIM-5 (range:0-25) and the Med-diet (range:0-55) scores. Higher values indicate a better erectile ability and Med-diet compliance respectively.

Results: In bivariate analysis the Med-diet score was positively associated with METs, CFR and the SHIM-5 score and negatively with PWV, AIx and UMALb (p<0.05). CFR, METs and the SHIM-5 score were also positively related (p<0.03). In linear regression analysis the Med-diet relation remained significant after correction for age, BMI, LDL, total cholesterol and systolic blood pressure. However introducing cigarette smoking as a cofounder abolished the above relations. Packs/year were positively related to AIx, UMALb and negatively to the SHIM-5 score (p<0.05). We also divided our population according to the mean Med-diet score (27) in high and low Med-diet groups. The high score group had higher METs and SHIM-5 score and lower PWV. Smokers had higher AIx and lower SHIM-5 score (pictures).

Conclusion: Cigarette smoking influences microvascular physiology and peripheral wave reflection and so abolishes Med-diet benefit on exercise capacity, coronary physiology, target organ damage and erectile ability in hypertensive males with ED. It is of vital importance consult this population avoiding smoking to restore cardiovascular health and quality of life.