Integral Effects of Systemic Nitric Oxide Synthase Inhibition on Carotid Arterial Compliance

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Int J Exerc Sci 2(1): S44, 2009. Decreased arterial compliance (increased arterial stiffness) is associated with cardiovascular events. Nitric oxide regulates vascular tone, which can influence arterial compliance. We previously investigated the effects of systemic nitric oxide synthase (NOS) inhibition on arterial compliance under the systemic α-adrenergic receptor blocking. In the present study, we investigated the effect of systemic NOS inhibition alone on central arterial compliance (via carotid arterial ultrasound imaging and applanation tonometry). Eighteen apparently healthy young adults (26±1 years) underwent intravenous infusions of NG-monomethyl-L-arginine (L-NMMA) or placebo (saline) on separate days. In the placebo control condition, no significant changes were observed in mean arterial pressure, cross-sectional compliance, and β-stiffness index. Mean arterial pressure increased significantly (84±2 vs. 96±3 mmHg) after the administration of L-NMMA, whereas there were no significant changes in cross-sectional compliance (0.11±0.01 vs. 0.12±0.01 mm2/mmHg), β-stiffness index (6.44±0.37 vs. 5.51±0.41 unit), or isobaric arterial compliance. Theses results in young healthy adults are not consistent with the idea that carotid arterial compliance is modulated by nitric oxide. Grant Support: This work was supported by Grants-in-Aid for Scientific Research from the Ministry of Education, Culture, Sports, Science and Technology of Japan (18300215, 18650186), JSPS Postdoctoral Fellowships for Research Abroad, and NIH grant AG20966.