

## Advanced glycation end products and arterial stiffness

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Accumulation of advanced glycation end products (AGEs) in the human body might engender arterial stiffening. We investigated the relationship of plasma AGE concentration with arterial stiffness, wave reflections and blood pressure amplification in a Chinese population.

The study subjects were recruited from a newly established residential area in the suburb of Shanghai in 2009. Using the SphygmoCor system, we measured carotid-femoral pulse wave velocity (cfPWV) and central (cAI) and peripheral augmentation indices (pAI). The central-to-brachial pressure amplification was expressed as the central-to-brachial systolic pressure difference (SPD), pulse pressure difference (PPD), and pulse pressure ratio (PPR). Plasma AGE concentration was measured by the ELISA method and logarithmically transformed for statistical analysis.

The 1051 study participants (mean age  $55.1 \pm 13.1$  years) included 663 (63.1%) women, 390 (37.1%) hypertensive patients and 90 (8.6%) diabetic or prediabetic subjects. Plasma AGE concentration was higher in men than women (5.62 vs 5.07  $\mu\text{g/mL}$ ,  $P=0.02$ ) and with older age ( $r=0.13$  in both sexes,  $P \leq 0.01$ ) and higher serum total-to-high density lipoprotein cholesterol ratio ( $r=0.20$  in men and  $r=0.15$  in women,  $P < 0.0001$ ). In multiple regression analyses, plasma AGE concentration was significantly associated with cAI and pAI (1.9% and 4.0% increase per 10-time increase in plasma AGE concentration, respectively,  $P \leq 0.02$ ) but not with cfPWV ( $P=0.62$ ). However, there was significant ( $P=0.001$ ) interaction between plasma AGE concentration and age in relation to cfPWV. Only in subjects of 70 years or older, cfPWV increased with higher levels of plasma AGE concentration (bottom vs. top quintile distributions 8.10 vs. 8.90 m/s,  $P=0.02$ ). Multiple regression analyses also demonstrated that plasma AGE concentration was significantly associated with PPR (2.39% decrease per 10-time increase in plasma AGE concentration,  $P=0.03$ ) but not with SPD and PPD ( $P=0.11$  and 0.13, respectively). In subjects with at least one of the following cardiovascular risk factors, ie, overweight/obesity, hyperglycemia and current smoking ( $P=0.03$ ), but not those without ( $P=0.55$ ), PPR tend to decrease with higher plasma AGE concentration.

AGEs accumulate with aging and high cholesterol and are associated with arterial wave reflections, arterial stiffness in an age-dependent manner and pulse pressure amplification as assessed by PPR, especially in the presence of cardiovascular risk factors.