AGED GARLIC EXTRACT WITH SUPPLEMENT SLOWED THE PROGRESSION OF METABOLICALLY ACTIVE EPICARDIAL ADIPOSE TISSUE, INFLAMMATION AND CORONARY ATHEROSCLEROSIS: A RANDOMIZED CLINICAL TRIAL

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Background: Aged garlic extract supplemented with B vitamins, folic acid and L-arginine (AGE-S) slowed the progression of coronary artery calcium (CAC). We recently reported that computed tomography (CT) can accurately assess metabolically active brown adipose tissue. This study evaluated the effects of AGE-S on metabolically active epicardial adipose tissue (mEAT), inflammation and CAC.

Methods: Sixty asymptomatic subjects, randomized to AGE-S vs. placebo, underwent CT at baseline and 12-month, and their CAC, mEAT and inflammatory biomarkers were measured. mEAT, adipose tissue inside pericardial sac with Hounsfield unit -10 to -87, was measured from slice level 15 mm above to the bottom of the heart. The content of oxidized phospholipids (OxPL) on apolipoprotein B-100 (apoB) particles detected by antibody E06 (OxPL/apoB), lipoprotein(a), IgG and IgM autoantibodies to malondialdehyde-low-density lipoprotein and apoB-immune complexes were measured. CAC progression was defined as an annual increase in CAC >15%.

Results: From baseline to 12 months, mEAT reduced in AGE-S as compared to placebo (-1.58±1.56 vs. 1.98±2.48, p=0.003). Similarly, CAC progression, IgG and IgM autoantibodies to MDA LDL and apoB-immune complexes were significantly lower in AGE-S to placebo (p<0.05). The adjusted risk of reduced mEAT was 7.69 (95%CI 2.52-23.25, p=0.0001) in AGE-S as compared to placebo. Strong correlation between decrease in mEAT and lack of CAC progression (r²=0.69, p=0.0001) was noted. The decrease in EAT correlated with increases in OxPL/apoB (r²= 0.76), and lipoprotein(a) (r²=0.67) levels, but negatively with IgM (r²= 0.90) and IgG (r²= 0.75) autoantibodies to malondialdehyde-low-density lipoprotein and apoB-immune complexes (p <0.001 for all). After adjustment for risk factors, the likelihood ratio of combined lack of CAC progression and reduction in mEAT was 12.82 (95%CI 4.05-41.66, p=0.0001) folds higher in AGE-S as compared to placebo.

Conclusion: AGE-S is independently associated with reduction of mEAT, inflammatory biomarker and progression of CAC. Decrease in mEAT was strongly correlated with increase in OxPL/apoB and lipoprotein (a) and decreases in immune complexes.