

Gallic Acid Reduces Plaque Burden in Male Mice

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Objectives: To determine if GA reduces plaque in a sex-dependent manner in atherosclerotic mice. Additionally, whether plaque burden correlates to changes in cholesterol (CHO) and inflammation.

Methods: Male and female atherosclerotic (ApoE^{-/-}) mice 3–4 months old (8/group) were treated with or without 0.2% GA in drinking water and chow diet for 2 weeks, then switched to high-fat diet (HFD) with and without GA for 5 weeks. Blood and aorta were collected for CHO and liver inflammation (AST, ALT) marker and en face plaque analysis, respectively. Livers and spleens were also collected and weighed; a higher weight associated with heightened inflammation.

Results: Males but not females receiving GA plus HFD had reduced plaque burden vs. HFD controls. Both the arch ($p = 0.012$) and descending (0.0017) portions of male aortas had reductions. GA did not reduce CHO, AST, ALT or liver weight, but reduced spleen weight in males and females. These data suggest GA reduces inflammation to attenuate plaque accumulation in males.

Conclusions: This study determined GA attenuated atherosclerosis in male but not female mice, and changes were independent of CHO, liver inflammation but corresponded with a reduction in spleen mass and inflammation. Findings are significant and suggest therapeutic potential because a prior study supplementing blackberries rich in GA reduced plaque in male mice, but this result could have been due to other components such as fiber.

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