TACSM Abstract

Short-term CD8+ T Cell Depletion Results in Decreased Large Artery Stiffness Via Decreased Collagen Content in Old Mice

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ABSTRACT

Cardiovascular disease is the leading cause of death in the United States. Advanced age is associated with large artery stiffness, partially due to increased collagen deposition within the aorta. Previously we have found that T cells accumulate in the aortas of old animals. A large proportion of these cells are CD8+ and produce inflammatory cytokines. We have previously demonstrated that CD8+ T cell depletion results in improved large artery stiffness. However, the mechanisms by which CD8+ depletion improves large artery stiffness are unclear. Therefore, we sought to determine whether CD8+ T cell depletion in old mice results in blunted aortic collagen deposition compared to old CD8+ intact mice. **PURPOSE:** To test the hypothesis that old CD8+ T cell depleted mice would exhibit blunted collagen deposition and collagen gene expression in the aorta compared to old CD8+ T cell intact mice. **METHODS**: Old (22-24mo) mice (n=5-12) were injected every 5 days with anti-CD8+ or isotype (control) antibodies for 28 days. On the 28th day, the mice were euthanized, a 5mm section of the aorta was saved for histology and the remaining aorta was cleaned and saved for qPCR analysis. Aortas were paraffin embedded, sectioned, and stained using picrosirius red to assess collagen content. Collagen content was quantified using ImageJ. Aorta collagen gene expression was assessed by qPCR. Group differences were assessed by independent samples t test. Data is presented as mean ± SEM (normalized to old Isotype; Units Arbitrary (AU)). **RESULTS**: Old CD8+ depleted mice exhibited blunted collagen deposition in both the medial (Control: 1.00±0.06 AU, Anti-CD8:0.78±0.07 AU; p=0.02) and adventitial (Control: 1.00±0.05 AU, Anti-CD8:0.81±0.05 AU; p=0.01) layers of the aorta compared to isotype controls. However, there were no differences in the expression of genes responsible for collagen creation, *Col1a1* (Control: 1.00±0.28 AU, Anti-CD8: 1.68±0.53AU, p=0.15) and *Col3a1*(Control: 1.00±0.46 AU, Anti-CD8: 0.89±0.35 AU, p=0.42). **CONCLUSION**: Short-term manipulation of CD8+ T cells results in blunted aortic collagen deposition but has no effect on collagen gene expression compared to old controls. The specific mechanisms in which old CD8+ T cells influence collagen deposition are unknown.