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Does exercise training prevent against stress-induced atherosclerosis?

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Chronic stress is an important risk factor for atherosclerosis, which is a chief process in the development of cardiovascular disease. Increased circulating levels of corticosterone have been documented in several animal models of chronic stress, which may one of the mechanisms of atherogenesis. Here, we hypothesized that 1) corticosterone treatment induces atherosclerosis 2) exercise training prevents against stress-induced atherosclerosis. To test these hypotheses, apolipoprotein E (ApoE)-deficient mice were fed a high-fat diet for 13 weeks with exposure to either corticosterone or vehicle in the drinking water (CORT and Con). Corticosterone treatment significantly increased atherosclerotic plaque area at the aortic root. Such exacerbation of atherosclerosis was accompanied by significantly lower levels of circulating white blood cells and serum interleukin-1・ (IL-1・), and significantly elevated serum concentrations of total cholesterol, low-density lipoprotein (LDL), very-low-density lipoprotein (VLDL) and small dense low-density lipoprotein (sd-LDL) in CORT mice when compared to Con mice. Corticosterone treatment did not change CCR2 expression on monocytes *in vivo* and *in vitro*. These findings demonstrate that corticosterone is sufficient to exacerbate atherosclerosis *in vivo*. Further studies are needed to clear whether exercise training prevents against atherosclerosis by reduction of stress.