Response of blood lipids to exercise training alone or combined with dietary intervention

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Methods: We reviewed papers published over the past three decades pertaining to intervention trials on the effects of ≥12 wk of AET on blood lipids and lipoprotein outcomes in adult men and women. Included were studies with simultaneous dietary and AET interventions, if they had appropriate comparison groups. Studies were classified by the participants’ relative weights expressed as mean BMIs. Information was extracted on baseline characteristics of study subjects, including age, sex, and relative baseline cholesterol levels; details on the training programs; and the responses to training of body weight, \( \dot{V}O_{2\text{max}} \), and blood total cholesterol (TC) and low-density lipoprotein-cholesterol (LDL-C), high-density lipoprotein-cholesterol (HDL-C), and triglyceride (TG). Results: We identified 51 studies, 28 of which were randomized controlled trials. AET was generally performed at a moderate to hard intensity, with weekly energy expenditures ranging from 2,090 to >20,000 kJ. A marked inconsistency was observed in responsiveness of blood lipids. The most commonly observed change was an increase in HDL-C (with reductions in TC, LDL-C, and TG less frequently observed). Insufficient data are
available to establish dose-response relationships between exercise intensity and volume with lipid changes. The increase in HDL-C with AET was inversely associated with its baseline level ($r = -0.462$), but no significant associations were found with age, sex, weekly volume of exercise, or with exercise-induced changes in body weight or $\dot{V}O_2max$. **Conclusion:** Moderate- to hard-intensity AET inconsistently results in an improvement in the blood lipid profile, with the data insufficient to establish dose-response relationships.

**Key Words:** EXERCISE; BLOOD LIPIDS; CHOLESTEROL; HDL; TRIGLYCERIDE