Exploring Aerobic Exercise Quantity and Quality for the Treatment of Dyslipidemia

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BACKGROUND

- A combination of genetic, environmental, and pathological factors negatively alter blood lipid concentrations towards an increase in “bad” small, dense LDL-C, and a decrease the “good” HDL-C, leading to dyslipidemia.
- Dyslipidemia is diagnosed by total cholesterol: ≥ 200 mg/dL, LDL-C: ≥ 130mg/dL or, HDL-C: <40 mg/dL
- Physical activity has shown to alter lipid levels through increasing HDL-C
- The increase in HDL-C traditionally seen from aerobic exercise results from lipoprotein lipase splitting triglyceride-rich lipoproteins as a means of supplying working muscles with fatty acid (Wittke, 1999)
- Available research has conflicting outcomes of the optimal frequency, intensity, and duration for treating dyslipidemia through aerobic exercise

PURPOSE

To examine changes in blood lipid levels in patients with dyslipidemia from different parameters of aerobic exercise to determine best practices for prescribing aerobic exercise to individuals with dyslipidemia.

METHODS

Table 1: Parameters of Interventions

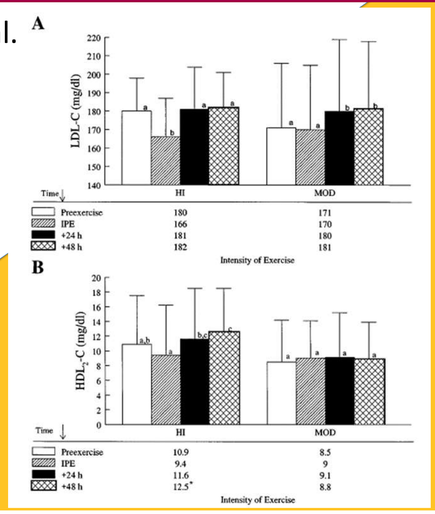
Authors	Subjects	Exercise Intervention
Crouse et al. (1997)	26 untrained men with known elevated total cholesterol Average age: 47 Average weight: 81 kg	Trained 3x per week until 350 kcal was reached at a moderate (50% VO2max) or high (80% VO2max) using a cycle ergometer Intervention duration: 24 weeks
Kraus et al. (2002)	159 sedentary and overweight or mildly obese with dyslipidemia Average age: 52 Average weight: 86 kg	Three exercise groups: <u>High amount, high-intensity:</u> caloric equivalent of jogging 20 mi/ week at 65-80% VO2max <u>Low amount- high-intensity:</u> The caloric equivalent of jogging 12 mi/week at 65-80% VO2max <u>Low amount- moderate-intensity:</u> The caloric equivalent of walking 12 mi/week at 40-55% VO2max Intervention duration: 6 months

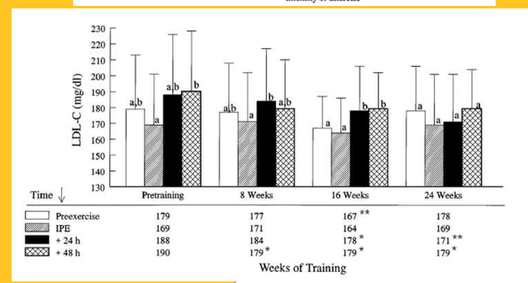
RESULTS

Table 2: Blood Lipid Outcomes

Kraus et al. (2002)	Pre-	Post-
HAHI	Cholesterol: 202.7 mg/dl LDL-C: 130 mg/dl HDL-C: 44.3 mg/dl	Cholesterol: 203.1 mg/dl LDL-C: 128.2 mg/dl HDL-C: 48.6 mg/dl
LAHI	Cholesterol: 202.3 mg/dl LDL-C: 131.6 mg/dl HDL-C: 46.6 mg/dl	Cholesterol: 206.4 mg/dl LDL-C: 135.2 mg/dl HDL-C: 46.9 mg/dl
LAMI	Cholesterol: 193 mg/dl LDL-C: 121.6 mg/dl HDL-C: 40.3 mg/dl	Cholesterol: 194 mg/dl LDL-C: 125.3 mg/dl HDL-C: 41 mg/dl

Crouse et al. (1997)





CONCLUSION

- For both exercise intensities, LDL-C reduction did not last into the 24-hour mark (figure A); improvement in HDL-C levels were only sustained into the 48-hour mark (figure B)
- Only at the 24-week mark of the intervention did participants have a reduction of LDL-C sustained through the 24-hour mark
- Crouse et al. (1997) tells us that exercise should be performed at least every other day to prolong lipid profile improvements. Exercise should also be performed long-term to extend improvements from a single-bout of exercise
- Kraus et al. (2002) showed the largest increase in HDL-C (table) •Data from Kraus et al. (2002) reveals that the greatest improvement in lipid-profile comes from high amount, high-intensity exercise. With the results shown in the lower amount of exercise, it may be the amount or duration of exercise may be the more significant factor in improving lipid profiles
- From the interventions, the most effective exercise intervention would be a long-term program including high frequency, with high duration of exercise
- A high-frequency, high duration program may be inappropriate for sedentary individuals beginning exercise, but it should be a goal to work towards

REFERENCES

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