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Overview of Lifestyle Interventions in the Management of Hyperlipidemia in the Primary Care Setting

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May 10, 2010 — The role of diet and exercise in the management of hyperlipidemia is discussed in a review for family physicians published in the May 1 issue of *American Family Physician*.

"Hyperlipidemia is a common risk factor for the development of cardiovascular disease," writes Robert B. Kelly, MD, MS, from Fairview Hospital and Cleveland Clinic Family Medicine Residency Program in Cleveland, Ohio.

"The Adult Treatment Panel III (ATP III) of the National Cholesterol Education Program has for the past decade recommended nonpharmacologic treatment as initial therapy in most patients with hyperlipidemia," Dr. Kelly writes. "The Therapeutic Lifestyle Changes (TLC) approach was based on the panel's review of the available evidence in 1999 that concluded that diet and exercise can have a beneficial effect on serum levels of total cholesterol, low-density lipoprotein (LDL) cholesterol, high-density lipoprotein (HDL) cholesterol, and triglycerides."

General dietary factors affecting lipid levels include modifying nutritional components, specific food intake, food additive and supplement use, and major dietary strategies. The greatest improvements can be achieved by decreasing saturated and trans fat intake; boosting consumption of polyunsaturated and monounsaturated fats; food fortification with plant stanols or sterols; isocaloric addition of tree nuts to the diet; intake of 1 to 2 alcoholic drinks per day; and following a Portfolio, Mediterranean, low-carbohydrate, or low-fat diet.

Other dietary strategies with less impressive benefits include lower dietary cholesterol intake, higher soluble fiber and soy protein intake, and consumption of fatty marine fish or use of marine-derived omega-3 fatty acid supplements. Compared with statin medications, red yeast rice supplements have similar benefits but are better tolerated by some patients.

Regular aerobic exercise, especially for 2 hours or more per week, is associated with improvements in lipid levels. Among unselected patients, the effects of brief physician counseling are relatively small. Physician efforts should therefore be focused on patients who are motivated and ready to implement lifestyle changes.

"Improvements in HDL cholesterol levels seem to be related more to the amount of activity than to the intensity of exercise or improvement in fitness," Dr. Kelly writes. "Physical inactivity has profound negative effects on lipid metabolism, including increases in LDL cholesterol levels, but this can be prevented by modest regular exercise....Because dietary approaches tend to lower total cholesterol, LDL cholesterol, and triglyceride levels, and exercise tends to raise HDL cholesterol levels and lower triglyceride levels, it seems logical to combine these approaches."

Specific Recommendations

Specific dietary and exercise recommendations, and their accompanying level of evidence rating, are as follows:

- Decrease saturated and trans fat consumption; for example, by limiting saturated fats to less than 7% of calories and by eliminating trans fats (level of evidence, C).
- Increase intake of polyunsaturated and monounsaturated fats; for example, by substituting polyunsaturated and monounsaturated fats for saturated and trans fats (level of evidence, C).
- Increase intake of soluble fiber; for example, by eating 3 oz of oats per day, or by using a psyllium supplement (level of evidence, C).
- Isocalorically increase tree nut intake; for example, by eating 1.5 oz of almonds, walnuts, or pecans per day (level of evidence, C).
- Increase soy protein consumption; for example, by eating 1.5 oz of soy protein per day or using tofu and soy foods to replace meat (level of evidence, C).
- Limit alcoholic drink consumption to 1 or 2 per day (1 per day for women; 2 per day for men; level of evidence, C).
- Increase consumption of plant stanols and sterols; for example, by eating 1 oz per day of certain buttery spreads (level of evidence, C).
- Increase consumption of omega-3 fatty acids from marine sources; for example, by eating 6 oz of salmon or tuna twice per week and by using an eicosapentaenoic acid plus docosahexaenoic acid supplement on other days (level of evidence, C).
- Follow a Mediterranean diet in which the main dietary fat is olive oil; other components include moderate wine consumption; reduced intake of red meat, dairy products, eggs, and poultry; and increased consumption of vegetables, whole grains, fish, and tree nuts (level of evidence, C).
- Follow the Portfolio Diet, which is primarily a vegetarian diet containing soy and other vegetable proteins, plant sterols, almonds, and soluble fiber (level of evidence, C).
- Participate in aerobic exercise for 120 minutes per week or more (level of evidence, C).

"It makes sense to help motivated patients learn which lifestyle changes are most likely to improve their lipid-related cardiovascular risk, and then measure the effects

that occur as they make changes," Dr. Kelly concludes. "Decreased intake of saturated and trans fats, increased intake of poly- and monounsaturated fats, moderate alcohol intake, supplementation with plant sterols or stanols, and isocalorically increased consumption of tree nuts are likely to produce the most beneficial changes in lipid levels.... Physicians should tailor advice to patients in the context of other health conditions and risks."

Dr. Kelly has disclosed no relevant financial relationships.

Am Fam Physician. 2010;81:1097-1102, 1103-1104. [Abstract](#)

Clinical Context

Initial treatment in most patients with hyperlipidemia should be nonpharmacologic strategies, according to ATP III. A review of available evidence in 1999 showed that dietary and exercise interventions may benefit lipid profile.

Physicians and their patients may have questions regarding how much change in blood lipid levels can be expected from following the TLC diet, as well as regarding which lifestyle changes are most beneficial. This review includes recent evidence that was not available when the ATP III analysis was performed.

Study Highlights

- Dietary recommendations intended to improve hyperlipidemia include the following:
 - Reduce saturated and trans fat intake (eg, by limiting saturated fats to < 7% of calories and by eliminating trans fats).
 - Increase polyunsaturated and monounsaturated fat intake (eg, by substituting polyunsaturated and monounsaturated fats for saturated and trans fats).
 - Increase soluble fiber intake (eg, by eating 3 oz of oats per day or by using a psyllium supplement).
 - Isocalorically increase tree nut intake (eg, by eating 1.5 oz of almonds, walnuts, or pecans per day).
 - Increase soy protein consumption (eg, by eating 1.5 oz of soy protein per day or by replacing meat with tofu and soy foods).
 - Limit alcoholic drinks to 1 per day for women, 2 per day for men.
 - Increase intake of plant stanols and sterols (eg, by eating 1 oz per day of certain buttery spreads).
 - Increase omega-3 fatty acid intake from marine sources (eg, by eating 6 oz of salmon or tuna twice per week and by using an eicosapentaenoic acid plus docosahexaenoic acid supplement on other days).
 - Follow a Mediterranean diet (olive oil as the main dietary fat; moderate wine drinking; less intake of red meat, dairy products, eggs, and poultry; and increased intake of vegetables, whole grains, fish, and tree nuts).
 - Follow the Portfolio Diet (primarily a vegetarian diet containing soy and other vegetable proteins, plant sterols, almonds, and soluble fiber).

- Take part in aerobic exercise for at least 120 minutes per week.
- The amount of activity, rather than the intensity of exercise or improvement in fitness, is most likely to result in improvements in HDL cholesterol levels.
- Modest regular exercise can prevent the markedly negative effects on lipid metabolism, including increased LDL cholesterol levels, of a sedentary lifestyle.
- Because dietary strategies tend to lower total and LDL cholesterol and triglyceride levels, whereas exercise tends to raise HDL cholesterol levels and lower triglyceride levels, using both approaches may have a synergistic effect.

Clinical Implications

- Dietary strategies most likely to achieve improved lipid profile include reduced intake of saturated and trans fats, increased intake of polyunsaturated and monounsaturated fats, moderate alcohol intake, supplementation with plant sterols or stanols, and isocalorically increased consumption of tree nuts.
- An exercise strategy most likely to improve blood lipid levels is to participate in aerobic exercise for at least 120 minutes per week. Because dietary strategies tend to lower total and LDL cholesterol and triglyceride levels, whereas exercise tends to raise HDL cholesterol levels and lower triglyceride levels, it is reasonable to combine both approaches.