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Nutrition Management of Elevated Lipids in Diabetes

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High Blood Sugar Keeps Bad Company

When a client with diabetes comes to the dietitian for nutrition counselling, the presenting problem is more than the high blood sugar. The problem is the entire metabolic syndrome that is associated with diabetes that requires aggressive intervention. Diabetes is associated with a metabolic syndrome that is characterized by increased abdominal girth, high triglycerides, low HDL, small, dense and atherogenic LDL as well as hypertension. At the time of diagnosis, 50% of people with diabetes already have some evidence of cardiovascular disease. In fact, the person with diabetes is felt to have the same risk of having a myocardial infarction (MI) as a non-diabetic person who has already had a MI. Diabetes is now recognized as an independent risk factor for CVD, increasing the risk of a CV event by up to 4x in the person with diabetes.

Goals for Treatment

For the above reasons, glucose control is only part of the treatment for the person with diabetes. Aggressive management of lipids, hypertension, along with blood sugar control, may help to reduce the risk of a CV event. The Canadian Recommendations for the Management and Treatment of Dyslipidemia have classified the person with diabetes as being at “very high risk for CAD”. The targets for a person with diabetes have been set at a LDL of 2.5 mmol/L, with a total cholesterol/HDL ratio of less than 4.0 and a triglyceride of less than 2.0 mmol/L. Annual blood work to track lipid profiles are recommended. More frequent testing to monitor response to lipid-lowering medication may be required.

Nutrition and Lifestyle Strategies to Lower LDL Cholesterol

There are several nutrition and lifestyle strategies that specifically target lipid abnormalities.

Strategy #1
Weight Loss

Weight loss with increased physical activity can improve the metabolic profile on several different fronts. Exercise acts to improve insulin sensitivity, as well as assist in weight loss. As we all know, weight loss of 15-20 lbs can often significantly improve or even normalize blood sugars. At the same time triglycerides drop and HDL cholesterol rises, and a 5-kg weight loss can lower LDL cholesterol by 5%. Although it does not directly affect the measured lipid profile, lower blood sugars reduces the glycosylation and oxidation of LDL particles, making them less atherogenic. In fact, any program that promotes weight loss will accomplish some metabolic improvement. We know however, that the underlying problem is more than just blood sugar. The presence of small dense, atherogenic LDL needs to be addressed.

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Registered Dietitians practicing medical nutrition therapy can employ specific strategies to improve the metabolic environment for the person with diabetes. After normalizing/improving blood sugars it seems reasonable to use the same strategies that are used in the hypercholesterolemic client, to improve LDL cholesterol in our diabetes clients.

**Strategy #2 Lowering Saturated Fat in the Diet.**

Both the CDA Guidelines for the Nutritional Management of Diabetes and ADA Nutrition Recommendations advocate that the saturated fat content of the diet needs to be reduced. There continues to be debate as to whether the lost calories from saturated fat should be replaced by carbohydrate or unsaturated fats. There is agreement that saturated fats derived from animal fats, hydrogenated fats, trans fatty acids and tropical oils need to be limited to 10% of calories or less, of total calories. Practically speaking, this means helping our clients make low fat selections, but also educating them on the types of fats and how to selectively choose unsaturated fats over saturated fats, and encouraging monounsaturated fats. Strategies to lower saturated fat intake include:

- Identifying lean selections of animal protein
- Limiting portion sizes of animal protein to 6 – 8 oz/day,
- Including 2-3 vegetarian meals/week
- Including fish (not deep fried) 3 times /week
- Select unsaturated cooking oils and spreads, while limiting these fats to approximately 6 tsp/day

These strategies will both lower the saturated fat intake and as well as effectively lower the dietary cholesterol content of the diet, resulting in a potential 15% reduction in LDL cholesterol.

**Strategy #3 Plant Sterols**

New on the market in Canada, is a margarine containing plant sterols. These are a potentially interesting addition to the toolbox of dietary strategies to lower LDL cholesterol. The addition of this type of margarine providing 1-3 grams of plant sterol each day can lower LDL by 5-9%. While eating a plant-based diet provides these sterols in the diet, this margarine allows a regular and consistent intake at a level that has real cholesterol lowering benefits. At this point The American Heart Association is suggesting that this strategy only be recommended for those who require LDL lowering, and that it is not necessarily a margarine for general population use. Health Canada has expressed similar concerns. Given that we are treating people with diabetes to a target LDL of 2.5 mmol/L, many people with diabetes could benefit from such a product. The addition of a plant sterol margarine could be considered as part of the suggested oils and spreads allotment each day.

**Strategy #4 Increasing Fibre**

In Canada, the CDA Guidelines for the Nutritional Management of Diabetes Mellitus encourage the inclusion of soluble fibre and low glycemic index foods. The inclusion of soluble fibre can reduce LDL cholesterol by 5%, while at the same time it may lower the glycemic excursion post-prandially. The goal is to achieve an intake of 5-10 grams of soluble fibre each day. A prescription for a diet high in soluble fibre might look like this:

- Select whole grain products,
- Select cereals with various brans, psyllium, oatmeal, etc 1/2-1 cup /day
- Select 2-3 fresh fruits each day
- Select 3 or more vegetables each day
- Select 1/2 cup of legumes daily or at least several times/week

As well, alcohol can be a major culprit in raising triglycerides and should be reduced or eliminated depending on the sensitivity of the individual. Often, once blood sugars are improved, triglycerides are improved, although they may not achieve a level of less than 2.0 mmol/L.

**Strategy #5 Soy Protein**

The growing public interest in soy protein is fueling the growth of more food products derived from soy protein available in the marketplace. Previously encouraging tofu to a North American population was a tough sell. Now that soy protein is found in more familiar foods it is easier for consumers to experiment with and to incorporate soy proteins into the diet. There are soy-based hot dogs, burgers, deli slices, spaghetti sauces, soy beverages, and snack foods. Studies have shown that including 25 grams of soy protein/day can lower LDL cholesterol by 5%. Other studies have suggested that including 12 grams of soy protein in combination with a diet high in soluble fibre can achieve a similar effect. To achieve 25 grams of soy protein in one day, a client would have to consume the following items in a day:

- 1 cup soy beverage
- 2/3-cup soy based cereal
- 1 soy based veggie burger or 1/4 cup of soy nuts

Even if the individual can not achieve such a level of soy protein, including soy-based meals 2-3 times each week helps to lower the saturated fat intake.

**Nutrition and Lifestyle Strategies to Lower Triglycerides**

Within the diabetes population, triglycerides are commonly elevated. The same strategies that improve blood sugars will also lower triglycerides namely,

- Weight loss,
- Moderating starchy portions,
- Limiting simple sugars, such as juices, pop, sweetened beverages
- Promoting slow releasing (low glycemic index) carbohydrate
- Encouraging exercise
- Medication may be required for blood sugar management or triglyceride lowering.

A nutrition strategy that may assist in managing elevated triglycerides when blood sugars are well controlled, is the inclusion of omega-3 fatty acids or a vegetable source of omega-3 fatty acid is ground flaxseed. Fish oil caplets are only suggested for those who have very elevated triglycerides and should be prescribed and monitored by a physician.
For most Canadian adults, sexual health is an important part of their overall well-being. In fact, most men and women expect to enjoy a healthy sexual relationship, including the option of sexual intercourse, well into their older years. Men who receive effective treatment for ED are usually thrilled with their improved sexual activity.

**DIABETES CAN CAUSE ERECTILE DIFFICULTIES**

**WHAT IS ED?**

ED is typically defined as the persistent inability to attain and/or maintain an erection that is satisfactory for sexual performance. The easiest to recognize, of course is complete ED, which is the inability to achieve an erection in any circumstance. But ED is more precisely a condition that occurs in various degrees. In fact, the majority of men with ED (82 per cent) have mild to moderate ED, which can be defined as intermittent and/or increasing loss of penile rigidity with an associated impact on sexual activity. Regardless of its degree of severity, men should consider ED a legitimate medical concern deserving of treatment. ED is not an inevitable result of aging.

**HOW IS ED ASSOCIATED WITH DIABETES?**

For men with diabetes, the blood vessel problems and nerve damage that may be present with diabetes can also cause a slow and progressive deterioration of erection quality over time. ED may also be caused by factors such as smoking, obesity, excess alcohol use and stress. Scientists believe that these factors may also be associated with type 2 diabetes, the kind that affects 90 per cent of Canadians with diabetes. Removal of these contributing factors could be important in preventing or minimizing the physical and emotional impact of both diabetes and ED.

**DIABETES CAN CAUSE ERECTILE DIFFICULTIES**

**CAN ED BE TREATED IN MEN WITH DIABETES?**

The good news is that regardless of the cause, the majority of cases of ED are treatable. ED doesn’t need to be a difficult subject to discuss, especially since today’s treatment options can give new hope for restoring sexual functioning. It is encouraging for men and their partners to know that there are safe and effective treatments now available. Your doctor can help you to decide whether or not to treat your erectile dysfunction and identify the best treatment option for you.

For more information on ED in men with diabetes or ED in general, call 1-800-951-2033 (an ED information line answered by a nurse) or visit www.yoursexualhealth.com.

Sexual Health Inventory for Men (SHIM) questionnaires have been included in this package to facilitate self-diagnosis of erectile dysfunction within individuals that consult with you.
Strategies to Raise HDL

The number one strategy for raising HDL is to lower the triglycerides as discussed above. Other lifestyle strategies include smoking cessation and exercise, both of which can improve HDL cholesterol.

While alcohol can help to raise HDL, it is not a strategy to be promoted, and will exacerbate triglycerides if they are already elevated. As well, alcohol can have potential interactions with glucose lowering medications.

In Conclusion

Many of the strategies outlined above are additions to the diet, and are more easily embraced than restriction or avoidance strategies. However, all of the above strategies cannot be implemented at once, and the diabetes educator will need to assess the readiness for change of each individual. Dietary and lifestyle change can be implemented in stages especially when there is a long-term relationship with the client.

It must also be said, that many people with diabetes, in spite of careful attention to diet and exercise, will require lipid lowering medication to help them achieve lipids levels approaching our LDL target of 2.5 mmol/L. While the evidence that we can prevent cardiovascular complications is not clear, intensive management is our best strategy for now, until we have such evidence.

References

7. Jenkins et al. The Effect on Serum Lipids and Oxidized Low-Density Lipoprotein of Supplementing Self-Selected Low Fat Diets with Soluble Fibre, Soy and Vegetable Protein Foods Metabolism 49:(1), 67-72

People with diabetes who also have abnormal lipid levels have an additional concern with which to contend in managing the health of their heart. Fortunately, getting lipid levels tested is simple. Effective lipid-lowering therapies are also widely available.

As many patients may already be aware, diabetes is associated with an increased risk of coronary artery disease (CAD). In fact, the risk of CAD is twice as high in diabetic men – and three to four times as high in diabetic women – as in nondiabetic men and women of the same ages.

What many patients may not know is that an elevated low-density lipoprotein cholesterol (LDL-C) level is a major risk factor for CAD in both men and women, with or without diabetes. Because diabetic patients are already at such high risk, a working group of Canadian experts recommends that they maintain particularly low lipid levels: LDL-C levels below 2.5 mmol/L, triglyceride levels below 2.0 mmol/L and the ratio of total cholesterol to high-density lipoprotein (HDL-C) cholesterol below 4.0—the same levels as are recommended for people who have had a previous heart attack.

Even patients who maintain tightly controlled blood glucose levels should have their lipid levels tested regularly and treated if necessary. A British study published in 1998 demonstrated that intensive blood glucose control reduces the risk of retinopathy or nephropathy in diabetic patients, but does not have much impact on cardiovascular risk levels.

Another study has shown that effective lipid lowering with drug therapy can reduce the risk of heart attack or cardiovascular death by 55% in people with diabetes and heart disease. This study used a statin drug, which is the drug class recommended by experts for people with elevated LDL-C levels, with or without elevated triglyceride levels.

Although lifestyle modifications such as dietary changes, exercise and weight loss can help to control cholesterol levels, Canadian experts recommend that diabetic patients with elevated lipid levels immediately begin drug treatment. Together, lifestyle changes and drug treatment can be effective in attaining target lipid values. This recommendation underlines the need for aggressive lipid management in these high-risk patients.

Sponsored by an unrestricted educational grant from Pfizer Canada Inc.
As Diabetes Educators, alerting your clients to the special care that people with diabetes need to take is all part of their diabetes management program. It’s particularly important for them to take proper care of teeth and gums since studies have shown that people with diabetes tend to be three times more susceptible to gum disease.

Colgate Total® Toothpaste is the only toothpaste clinically proven to go beyond cavity protection to fight plaque, tartar, and gingivitis, the first stage of gum disease. Therefore, brushing with Colgate Total® flossing, eating a balanced diet, and making regular visits to your dentist are all important things to remember for proper oral health.
**Fibre 1**

General Mills has included a full sized sample of their Fibre 1* cereal. Fibre 1* currently offers the highest source of dietary fibre among high fibre cereals (Source: Survey, Chatelaine, June 2000). Fibre 1* is also low in fat, and cholesterol free. As you teach your clients to be label savvy you will probably want to point out that a half cup serving of Fibre 1* has 13 grams of fibre and, although it has no sugar added, aspartame gives it a palatable sweetness. The half cup (30g) serving has a Canadian Diabetes Association Food Choice Value of 1 Starch Choice. The two separately sealed packs guarantee freshness and crunch.

**Smucker’s**

Smucker’s serves up five No Sugar Added Fruit Spreads.

Here’s a tasty treat for people who follow a sugar-reduced or carbohydrate-reduced diet. J.M. Smucker’s delicious line of No Sugar Added Fruit Spreads is sweetened with Sucralose, the only sweetener that’s actually derived from sugar.

“The advantage of Sucralose over other artificial sweeteners is that it delivers a similar taste to that of sugar,” Product Manager Peter Saikali points out. “So our No Sugar Added Fruit Spreads really match the tasty, wholesome fruit flavour that makes our regular Fruit Spreads so popular.”

Sucralose has other advantages for people with diabetes. The body does not recognize it as a sugar or carbohydrate, so it does not influence carbohydrate metabolism, insulin secretion, fructose absorption, glucose absorption, glucose utilization and short- or long-term blood glucose control.

The Smucker’s line of No Sugar Added Fruit Spreads includes everyone’s favourite fruit flavours - Strawberry, Raspberry, Apricot, Orange and Blueberry. Each 15 mL serving (1 tbsp) has just 20 calories, 0 g fat and 5.4 g of carbohydrate. In Canadian Diabetes Association food value terms, that represents a 1/2 Fruits & Vegetables Choice rating.

“People with diabetes and consumers with low sugar needs can spread our No Sugar Added Fruit Spreads on thick, just the way they used to enjoy their jam, but without the added sugar,” adds Mr. Saikali. For anyone who is sacrificing sugar, that’s sweet news indeed.

**Contact Us**

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**Life Scan**

Helping People with Diabetes Change: Stages of Change

Julie Devlin, RN, CDE

The Stages of Change model, also known as the Transtheoretical Model of Change (TTM), has become the focus of a unique program for diabetes educators in Canada. A small group of educators were motivated to pursue the development of this theory in their diabetes practice, after attending a 1994 seminar introducing James Prochaska and his original TTM work in smoking cessation.

The central hypothesis of the TTM is that not all individuals are prepared to take action to change their behavior at a given point in time. Further, individuals pass through stages varying in their characteristics related to self-efficacy and decisional balance. By knowing an individual’s stage, helping professionals can design/select the strategy that is “The right thing for that person at that time”.

The Stages of Change Model may be used to guide any therapeutic intervention, whether it be an individual encounter, a one-page poster or an entire program of learning. With individuals, it may be used to guide the content, pace and style of your assessment process and individuals plan of care. With group classes, it may be used to develop stage-based objectives and plan appropriate teaching strategies to accomplish them. It may be used to develop teaching tools or handout materials that are appropriate for different learning objectives.

The TTM does not replace guidelines for good communication/education skills – it suggests that we could use them more effectively through a stages of change approach to assessment and planning.

The program have been a great success with over 30 workshops held in various provinces across Canada. For more information about workshops or professional practice materials, please email the LifeScan Education Institute Coordinators at lei@lifescancanada.com.

**The Stages of Change**

Change of any kind comes in stages. Success is movement from one stage to the next. The stages are:

**Precontemplation**

When someone has no intention of changing a particular behavior.

**Contemplation**

When they are thinking about change but the barriers to change still outweigh the benefits.

**Preparation**

When the reason to change begins to outweigh the barriers and the subject starts making a plan to begin change in the next 30 days.

**Action**

The slipperiest stage, when the subject has changed the behavior but is at most risk of sliding back or recycling into an earlier stage. Support and encouragement can help keep the subject from losing confidence and slipping back.

**Maintenance**

When the new behavior has been successfully in place for six months or more. Here again support reduces the risk of recycling.