Nutrition: High Cholesterol and Heart Disease - Part 1

Hey, everybody, in this section we're going to talk about customizing diet and lifestyle for high cholesterol and heart disease. So of course, for 50 years we've been told that intake of dietary cholesterol is a key contributor to heart disease and cardiovascular disease, but we now know that that's not the case. Studies show that about 75 percent of the population's cholesterol levels are not affected at all by their dietary intake. The remaining 25 percent do experience an increase in LDL, but they also experience an increase in HDL, so there's no net change in their LDL-to-HDL ratio, and it's thought because of that there's really no clinical significance to any increase that that 25 percent sees when they eat cholesterol-rich foods like eggs. And even the US, which was the last holdout, has finally removed its restrictions on intake of dietary cholesterol, so in the US dietary guidelines they no longer suggest limiting the intake of dietary cholesterol because the research is so overwhelming, it is a non-issue when it comes to heart disease.

So if dietary cholesterol doesn't cause heart disease, does saturated fat? Of all the long-term studies on saturated fat and cholesterol levels, only one showed an association and it was weak. However, these studies are just looking at averages, so if on average, cholesterol doesn't go up in a study looking at saturated fat and cholesterol levels, that means that in some people it probably did go up substantially, in most people it didn't go up at all, and in some people it went down, and if you average all that out, it's no net change, but as clinicians we don't treat averages, we treat individuals, so it's important to recognize that just as with dietary cholesterol, some people tend to be hyper-responders to saturated fat, and you will see people who switched to a low-carb, high-saturated fat diet whose cholesterol levels really skyrocket. Now, the clinical significance of that and whether saturated fat is associated with heart disease is a whole other story, and we're going to talk about that more later, in the blood chemistry unit.

So if dietary cholesterol and saturated fat don't cause high cholesterol and heart disease, what does? Well, genetics plays a role in determining susceptibility, but probably the two biggest causes statistically speaking in terms of pathology would be metabolic dysfunction and inflammation. While there are other contributing factors, such as poor thyroid function and infections, I would say again, statistically speaking, metabolic dysfunction and inflammation are the two main causes. LDL-P, or LDL particle number, or APO-B, which is a proxy for LDL particle number, is a marker, essentially, for metabolic dysfunction and can be a great way to judge the efficacy of dietary and lifestyle interventions, so keep that in mind and again, we'll talk more about that later.

For patients with elevated LDL-P or APO-B, you'll need to determine the cause of the elevation. As I mentioned, genetics plays a role, but typically, insulin resistance or metabolic dysfunction will be the more common cause, along with other factors like infections and poor thyroid function. We'll talk more about blood testing options in the blood chemistry unit, but the NMR LipoProfile from LabCorp and the True Health diagnostic panel, which is formerly known as Health Diagnostics Laboratory panel, are really good options.

If your patient has insulin resistance, the best dietary approach, at least to start with, would be a low-carb diet. A high-carb diet can in some cases, if it's high in processed carbs, not so much with Paleo-friendly carbs, but a high-refined-carbohydrate diet will increase triglycerides, which can then increase the amount of LDL particles, while a low-carb can reduce triglycerides and thus reduce LDL particle number. Typically, a diet of less than 20 percent or even less than 15 percent of calories from carbohydrate is a good level to aim for, but you'll need to work closely with the patient over time to find the proper level of carbohydrate needed for all of their health conditions, not just cardiovascular disease prevention. You should be aware that a low-carb diet will often temporarily increase LDL particle number of LDL cholesterol. Don't be alarmed as long as the LDL-P or APO-B is trending downward over time. This short-term effect can typically last for three to six months and is related to the liver unpacking fat. A lot of these patients have fatty liver. In some cases, though, this can persist; the effects of a low-carb diet will actually increase LDL particle number and LDL cholesterol and lead to a sustained elevation over time, and again, we'll discuss whether this a problem when we talk more about testing for lipid issues in the blood chemistry unit.

Patients with insulin resistance should avoid snacking. You may also want to recommend that your patient try intermittent fasting if it's appropriate, as this also improves insulin resistance. You can refer back to the intermittent fasting presentation for more information on implementing this with your patients.

For patients whose elevated LDL-P is due to genetics, such as those with conditions like familial hypocholesterolemia or APO-E4 genotype, a low-carb diet is probably not the best approach, as it tends to increase their LDL-P, in my experience. Instead, these patients should follow what I call a Mediterranean Paleo diet; this means focusing on including more carbohydrate in their diet from Paleo-friendly sources like fruit and starchy tubers, and then potentially full-fat dairy, grains, and legumes that have been properly prepared, if they are tolerated.

Those with genetic causes of high LDL should also experiment at least with reducing their saturated fat intake and focus and monounsaturated fats like olive oil, avocados, nuts, and omega-3 fats from cold-water fish and shellfish. It may be necessary to reduce their intake of added fat overall. This means instead of adding several chunks of butter to their sweet potato, maybe a small drizzle of olive oil would suffice, and these patients may want to favor lean cuts of beef, chicken, turkey, and fish over the fattier cuts of beef and lamb. You'd want to make sure that they're getting enough glycine, in that case, to balance out the effects of too much

methionine from lean protein. You don't need to restrict their fat intake to a particular gram level; in most cases, simply following these rules of thumb will get good results.

No matter what the particular presentation, there are a few foods that everyone with a higher risk of heart disease should focus on. The first of these foods is cold-water fish, which is a great source of long-chain omega-3 fats, EPA and DHA, as well as other nutrients like highly bioavailable protein and selenium. These have been shown to decrease the risk of cardiovascular disease by decreasing inflammation, increasing membrane fluidity, and positively changing gene expression. Focus on fish with high levels of EPA and DHA, such as salmon, mackerel, herring, sardines, anchovies, and sea bass. Aim for one pound to 20 ounces of fatty fish per week, ideally.

The next group would be monounsaturated fats. Monounsaturated fats reduce LDL cholesterol and LDL particle number and triglycerides and increase HDL. They also decrease oxidized LDL, reduce oxidation and inflammation, lower blood pressure, decrease thrombosis, and may reduce the incidence of coronary heart disease. These include olives, olive oil, avocados, and macadamia nuts, to name a few. Daily intake should be at least about a handful of macadamia nuts, a quarter to half an avocado and one tablespoon of olive oil.

Those with a higher risk of cardiovascular disease should also increase their intake of antioxidant and polyphenol-rich foods. Antioxidants help to reduce oxidative damage while polyphenols have a multitude of benefits, such as increasing insulin sensitivity, lowering blood pressure, and lowering oxidized LDL. Encourage patients to "eat the rainbow," as well as meats, organ meats, eggs, and grass-fed dairy, which are high in antioxidants such as CoQ10 that are not found in plant foods.

Nuts are also a great choice for those with higher cardiovascular disease risk. They've been shown to reduce a wide array of cardiovascular disease risk factors, such as body mass index, waist circumference, and systolic blood pressure. Tree nuts are the most beneficial, which include almonds, brazil nuts, cashews, chestnuts, filberts, which are also known as hazelnuts, macadamia, coconuts, pecans, pine nuts, pistachios, and walnuts. Note that nuts are easy to overeat, so encourage your patients to aim for only a handful of nuts every day or several times a week.

Fermented foods are a good choice for those with high LDL particle number or higher risk of heart disease. They result in a modest but significant reduction in lipids, and also have non-lipid effects including increasing antioxidant potential and lowering blood pressure, leptin, fibrinogen and interleukin-6, which is a potent inflammatory cytokine. Fermented foods like sauerkraut, kimchi, beet kvass, kombucha, kefir, and yogurt are all part of a heart-healthy diet and should be eaten regularly. A typical day may include one to two tablespoons of sauerkraut at each meal, a half cup of beet kvass or kombucha, and maybe a half cup of yogurt or kefir.

There's a lot of debate about how effective soluble fiber is at improving lipid levels and reducing the risk of heart disease, but several large studies show a strong inverse association between soluble fiber intake and coronary heart disease, heart attack, and peripheral artery disease. Soluble fiber binds bile acids or cholesterol, upregulates LDL receptors in the liver, increases clearance of LDL, inhibits fatty acid synthesis by producing short-chain fatty acids like acetate, butyrate, and propionate, improves insulin sensitivity, and increases satiety with lower overall energy intake. It also provides food for beneficial gut bacteria, which as we just reviewed may reduce the risk of cardiovascular disease.

While the dietary changes we've discussed are very useful, you may also want to consider adding some supplements for your patients at higher risk of heart disease. We'll discuss these in more detail in another presentation, but for now, know that they include vitamins A, D, K2 and C, as well as tocotrienols, pantethine, fish oil, probiotics and prebiotics, whey protein, curcumin, red yeast rice, and CoQ10.

Nutrition is just one factor that affects heart disease risk, of course. Lifestyle factors are just as important and should not be overlooked. Stress management should be taught to all cardiovascular disease patients, and you should encourage them to find a stress management technique that they'll enjoy and will do continuously, such as meditation, tai chi, deep breathing, etc. It's worth pointing out that one study found that meditation was more effective than statins in preventing a risk of a second heart attack in middle-aged African American men that had already had a heart attack, so don't underestimate the power that stress management can have on cardiovascular disease prevention.

Chronic sleep deprivation is associated with weight gain, systemic inflammation, and has been shown to double the risk of heart disease. It's especially important that you assess your patients for proper sleep hygiene and follow the recommendations that we're discussing elsewhere in the exposome unit to improve their sleep.

Exercise, of course, is also very important for cardiovascular disease risk reduction. Benefits of exercise are related to maintenance of body weight or weight loss, if needed, blood pressure control, return of insulin sensitivity, and beneficial changes in lipids, all of which in turn promote endothelial stabilization and vascular health. So it's important not only to encourage patients to exercise, but to encourage them to sit less and stand and walk more. The targets would be at least 150 minutes of moderate-intensity activity per week, like jogging or yoga, 75 minutes of strenuous activity such as running or playing sports, or 30 minutes of high-intensity activity like sprinting or strength training at full effort. Now, they don't have to do all of this, but one of these categories or some combination of all three is what they want to aim for. Make sure also to assess patients that are already very active for overtraining, especially if they're complaining of fatigue or being worn out.

Okay, thanks for watching. In the next presentation, we're going to talk about managing high blood pressure with dietary and lifestyle changes, so see you then.