

DYSGLYCEMIA, INSULIN RESISTANCE, & DIABETES

By Elizabeth Lipski, PhD, CCN

ONE OF THE MANY THINGS a clinician must be aware of and recognize is transient hypoglycemia. While not a disease, it can have severe effects on a person's quality of life. And hypoglycemia often precedes diabetes and insulin resistance. 20-25% of us probably have insulin resistance. And most type two diabetics have more than enough insulin, their problem is rather that cellular uptake is poor. Because the uptake is poor, the body produces more insulin to make up for the resistance problem.

Insulin resistance is an expression of a genetic predisposition. Some people will trigger a response, while others with healthier life-styles and luck of the draw may never express insulin resistance. Diet, weight, and exercise all play important roles in modulation of this genetic expression.

Signs of insulin resistance include: hypertension, obesity, high triglycerides, low HDL cholesterol, apple shaped rather than pear shaped people, sugar cravings, sleepiness after meals, hypoglycemia, carbohydrate addictions, difficulty with weight loss, and in women increased facial and body hair, hormone imbalances, and acne.

About 50% of all people with hypertension are insulin resistant.

Family or personal history can include any of the above, plus diabetes, heart disease, and specifically heart disease in which there aren't any identifiable risk factors.

With diabetes and insulin resistance is an accompanying glycation response. Hemoglobin A1C is the most common factor which is measured for glycation. Because the life of a red blood cell is 3-4 months, a HmgA1C measurement can give an average blood sugar level reading for a 3-4 month period. This is a useful tool in follow-up to see if a patient is compliant over time. Studies show that the more normal HmgA1C is, the less long-term risk of long-term complications of diabetes. Normal HmgA1C levels are 5-7, and diabetics who can achieve these levels experience greater health than those with higher levels. Anyone with a level above 9 should be carefully educated, coached, and encouraged to make every effort to bring their HmgA1C level into better control. Glucometer testing twice daily really helps a diabetic to control and understand their own body function and the effects of diet and exercise on their illness.

Other proteins in the body also become glycosylated. Glycosylated albumin and fructosamine can give accurate information about current glycosylation. HealthComm is experimenting with a fructosamine finger stick office test and we look forward to their results. Glycosylated cells are covered with sugar molecules. They can be compared to a gumdrop—the sugar on the outside is rough. When these glycosylated cells touch others they cause irritation and inflammation, producing cytokines and antibodies to the body's own proteins.

Glycosylation has been associated with diabetes, periodontal disease, rheumatoid arthritis, Alzheimer's disease, and coronary heart disease.

As research is done, it is likely we will find glycosylation to be involved with many more areas of aging.

Clinically insulin resistance can be measured with a fasting insulin test or a two-hour post-prandial insulin test. If insulin resistance is found, therapeutic measures can then be taken to enhance cellular response to insulin and to calm down excessive production of insulin.

As far as diet goes, people with dysglycemia need to eat a wholesome diet of natural foods. There are two schools of thought about dysglycemia, some advocate a high fiber, high complex carbohydrate diet while others advocate a high protein, moderately high fat, relatively low carbohydrate diet. It seems that the choice of which to use is a reflection of individual biochemical needs which are reflected throughout our population. People with diabetes, hypoglycemia, and insulin resistance need a diet that is high in nutrient density. We've robbed our bank accounts of available nutrients and now it's time to replace those nutrients so that our bodies can function optimally. While most practitioners make a diabetic diet seem like an impossible task, the truth is that diabetics need to eat a diet that is exactly the same as anyone else who eats a wholesome and balanced way. This includes little wasted caloric intake: low sugar, low alcohol, low caffeine, high quality fatty acids, high quality lean protein, high fiber foods, few processed foods, ample amounts of fruits and vegetables, and water. It is also important to screen for food sensitivities and to remove immune stimulating foods from the diet.

James Anderson, MD at the University of Kentucky has had great results with a high complex carbohydrate, high fiber diet. Studies have been shown to significantly improve blood glucose control and reduce blood lipids when compared

to a low carbohydrate, low fiber diet. The level of fiber in the Anderson diet is 45grams daily, 55-60% calories as carbohydrates (not sugar or other simple carbohydrates), 12-20% as protein, and less than 30% fat. People on his program use up to a cup of legumes daily plus high soluble fiber foods such as oats. Other considerations are vitamin and mineral supplementation, alternative sweeteners, salt intake, decreased alcohol consumption. Individualization of all programs to meet each person's needs is critical for success. High fiber foods slow down absorption and act as a time-releasing substance for foods eaten. This helps flatten out the glycemic curve. Use of the glycemic index is a tool that should be used by all people with insulin resistance of dysglycemia. These foods are absorbed more slowly and have less effect on insulin and glucose. This diet can cause enormous problems unless people are eating high quality carbohydrates:

Other researchers, such as Revan, have found that a high protein, high quality fat, and relatively low carbohydrate diet works best for people with insulin resistance and syndrome X. Protein is 30% of total calories, Fat, 30%, carbohydrate 40% with emphasis on low glycemic index foods. This has been popularized by Barry Sears, Stillman, Robert Atkins and others and is the standard concept behind much of the standard diet used with diabetics.

In practice, diabetics are taught little about the vibrancy of foods or the life energy that foods impart. Offices are filled with Nutrasweet products, packaged foods, and white flour products. Some concession is made to use of whole grains, but generally the emphasis is placed on carbohydrate counting and exchange diets. These food plans while in essence are useful are only beginning steps in teaching the patient about the necessity to eat foods that are enzymatically alive, pesti-

side free, and whole. Working with someone to gradually introduce healthful dietary changes takes time, patience, and a lot of explanation. If people understand the health benefits of certain food choices over others, they will gladly make the changes. This needs to be done in small increments—if each person makes one significant change per month, in a year's time they'll eat in a totally new way.

Exercise is of key importance in dysglycemia. Many people find that with regular exercise they can eliminate or forestall the need for diabetic medication. Aerobic exercise is of critical importance because of its effect on the heart muscle, endurance, slow release of glycogen, stress management value, and fat burning. Anaerobic exercise is critical for improvement of muscle mass and increased glycogen stores. It is important to do both aerobic and strength building exercise at least 5 days each week. Longer and less intensive exercise, 45-90 minutes each session, will most likely promote the greatest benefits.

Use of nutritional supplements designed to replace organ reserves, lower insulin levels and increase insulin sensitivity are recommended. Research implicates benefit with diabetes and insulin sensitivity with nearly every nutrient, so a foundation multivitamin and mineral supplement (not a one a day, but rather 4-6 tablets or capsules) will insure adequate intake of all basic nutrients. In addition they may also require additional: Omega 3 fatty acids, magnesium, B-complex vitamins, chromium, vanadium, vitamin E, antioxidants such as glutathione, lipoic acid, co-Q 10, vitamin C, etc.

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