TOXINS AND INSULIN RESISTANCE

The fact that toxic exposures in the environment can contribute to insulin resistance and diabetes is largely unrecognized or ignored. Extensive research has shown that a wide variety of environmental pollutants can create insulin resistance and contribute to diabetes. Particularly problematic are xenoestrogenic substances, pollutants which activate the estrogen receptor sites on cells. Xenoestrogens have been implicated not only in insulin resistance, but also the development of various types of cancers.

PRIORITY POLLUTANTS

In one study the 10% of a population group with the highest levels of six common pollutants had an incidence of diabetes 38 times higher than the 25% of the group with the lowest levels of these pollutants. The presence of these pollutants was a greater risk factor in this study than was carrying excess fat.

In a recent study blood and fat levels of persistent organic pollutants were significantly correlated to blood sugar levels in obese individuals. The researchers concluded that pollutants contribute to both obesity and diabetes.

The presence of toxic exposures is so powerful that it can even override the benefit of some of the most beneficial foods and supplements used in treating the symptoms of insulin resistance.

Omega-3 fatty acids are powerful natural anti-inflammatory substances and repeated studies have shown their benefit in improving insulin resistance. Nevertheless, when adult male rats were fed crude salmon oil containing persistent organic pollutants they developed insulin resistance, abdominal obesity, and fatty liver. Organochlorine pesticides were particularly powerful inhibitors of insulin action in this study by Jerome Rezzin and associates.

Anyone consuming fish or using fish oil products should be aware of the importance of testing to make sure they are receiving minimal exposure to these pollutants which actually increase the risk of insulin resistance.

PLASTICS

Plastics can contain substances which have been shown to induce insulin resistance as well. Plastics are identified with a triangle composed of arrows to aid in recycling. Numbers 3, 6, and 7 have been associated with significant health risks.

Bisphenol A is included in the number seven category. This common pollutant is found on the inside plastic liner of canned goods, cash register receipts, and plastic bottles. A study by Paloma Alonso-Magdalena and associates found that bisphenol A has an estrogenic effect which disrupts the functioning of the cells in the pancreas which produce insulin (beta cells) leading to insulin resistance. This study was conducted in living creatures rather than in a test tube.

DIRTY ELECTRICITY

Magda Havas and David Stetzer suggest that those with insulin resistance be tested for electrical hypersensitivity. We are increasingly being washed in a constant bombardment of electrical fields as a result of electronic equipment like cell phones, computers, and televisions.

These researchers share the story of an 80 year old woman with diabetes whose home was saturated with what is called dirty electricity or poor power quality. After installing filters to remove the dirty electricity the woman’s average morning fasting glucose level dropped from 171 to 119 mg/dL a week later. Her average insulin intake dropped from 36 to 9
units within a week.

The impact of electromagnetic fields on blood sugar and insulin resistance has been little studied and is mentioned here simply for completeness.

REFERENCES:


Havas, Magda, Electromagnetic hypersensitivity: Biological effects of dirty electricity with emphasis on diabetes and multiple sclerosis, Electromagnetic Biology and Medicine, 2006;25:259-268.


https://commons.wikimedia.org/wiki/Category:Bisphenol_A#/media/File:FDA_Continues_to_Study_BPA_(6883486850).jpg

DEALING WITH TOXIC EXPOSURES

The real question is what to do about toxic exposures. The approach discussed here is two-fold. Firstly, we should seek to avoid exposure to toxins which impact blood sugars and insulin resistance. Secondly, we should support the ability of the body to cope with these toxins without suffering significant damage. This should involve foods and supplements with two characteristics: anti-inflammatory properties and antioxidant activity. Inflammation and free radical activity are the mechanisms involved in damage from most toxic substances.

AVOIDING EXPOSURE

ORGANIC FOODS

A study by Lu and associates found that if children were given organic diets blood levels of the pesticides malathion and chlorpyrifos were significantly lower within 24 hours. The first step in reducing the risk that toxic substances will contribute to insulin resistance is to avoid exposure. Malathion, which was virtually undetectable while children were eating organic diets, is known to induce insulin resistance.

THE DIRTY DOZEN

The Environmental Working Group evaluates supermarket produce for toxic residues on a yearly basis. The results are published as the Clean Fifteen and the Dirty Dozen Plus. The Clean Fifteen are foods that rarely contain toxic residues. The Dirty Dozen Plus are the dirtiest, most toxic of all foods tested. One need not worry about purchasing the Clean Fifteen organic, while the Dirty Dozen should always be organic. You will find a link to this information under “Tools” at www.imageawareness.com.

IMPROVING COPING ABILITY

DETOXIFICATION

Research has shown that some forms of supplementation can provide protection from toxic exposures by aiding the process of detoxification. One way of reducing the toxic burden is to replace contaminated body fats by mobilizing fat and replacing it with high quality fats which are not contaminated.

Many years ago I was introduced to the controversial Hubbard protocol for detoxification. The object of the program was to induce sweating by sauna and exercise. The sweat was laden with fat soluble toxins. The sweat was removed and the diet supplemented with uncontaminated fats and nutrients lost by sweating.

The Hubbard protocol introduced me to the idea of phospholipid exchange. The idea is to supply quality lipids of the highest quality to rebuild faulty cell membranes. This procedure not only replaces contaminated fats in the body, but also improves the functioning of the cell membranes allowing them to throw off toxins and to pass toxins from the inside of the cell to the outside.

Patricia Kane and associates head up a group which focuses on cellular detoxification. They write, “Healing the outer leaflet of the membrane...with phospholipid therapy, is our highest priority in addressing chronic illness...” Elsewhere they write, “The lipid membrane...is the heart of the health of the cell...”

Supplementation with proprietary phospholipids and an omega-3 supplement tested for over 200 pollutants with a standard of ZERO promotes a fatty acid exchange at the cellular level that can both reduce toxin levels and energize the cells to dispose of ac-
Bisphenol A is a reproductive toxin causing infertility in male mice. Once again carotenoids appear to be protective. The carotenoid lycopene, the red pigment in tomatoes and watermelon, protected male mice from Bisphenol A induced free radical damage to the testis which normally leads to infertility. The same nutrient has been shown to protect men from developing prostate cancer.

Astaxanthin, another carotenoid, has shown a wide range of benefits in animal models of diabetes either alone or in combination with vitamin E. The carotenoid both improved insulin sensitivity and reduced oxidative stress induced by high blood sugars. It is probably safe to assume that other carotenoids and antioxidants are important in the prevention of diabetes.

A study by Ford and associates concluded, “All serum carotenoids were inversely related to fasting serum insulin after adjustment for confounders....If confirmed, these data suggest new opportunities for research that include exploring a possible role for carotenoids in the pathogenesis of insulin resistance and diabetes.”

REFERENCES:

VITAMIN D3

Vitamin D is the sunshine vitamin. It is formed on the skin when it is exposed to sunlight. Unfortunately, modern lifestyles have greatly decreased the amount of time people spend in the sun. Sun blocks also block vitamin D formation in the skin. For these reasons, widespread vitamin D deficiencies exist.

There is strong evidence to suggest that adequate vitamin D3 is highly protective against the development of insulin resistance although the mechanism is poorly understood. A recent look at 28 independently conducted studies showed that healthy vitamin D intake reduced risk of diabetes by 55%, risk of heart disease by 33%, and risk of metabolic syndrome by 51%. The researchers considered 50 nmol/L a healthy level and noted that 30-50% of all children and adults are at risk of vitamin D deficiency.

Vitamin D levels have been shown to be lower in those with both Type 1 and Type 2 diabetes. Janet Raloff in Science News references a study in which increasing the blood measurements of vitamin D3 from 35 nmol/L to 75 nmol/L, essentially doubling the blood levels of vitamin D, improved insulin sensitivity by 60% “which is a greater increase than many anti-diabetes drugs provide.”

REFERENCES:

SLEEP

Sleep apnea affects 24% of men and 9% of women in the United States. This disorder makes it almost impossible to get a good night’s sleep. It is well documented that even partial cumulated toxins and waste products.

Long chain omega-3 fatty acids as found in fish have been shown to improve insulin action in muscle, partially by lowering triglyceride levels in the muscle. Short chain omega-3 fats as found in flax oil did not improve insulin action in this animal study. As discussed previously, freedom of fish oils from contamination is a primary concern if one wishes to optimize the benefits of fish oil for improving insulin resistance.

REFERENCES:
Lu, Chensheng, et al., Organic diets significantly lower children’s exposure to organophosphorus pesticides, Environmental Health Perspectives, February 2006;114(2):260-263.

PROTECTIVE NUTRIENTS

Several nutrients have been shown to protect against the toxic blood sugar effects of PCB’s. Vitamins C, D, B6 and carotenoids have been shown to be protective. Of these nutrients carotenoids appear to be the most protective. The researchers wrote, “In particular, serum carotenoids have been shown to be strikingly protective in the probability of metabolic syndrome, despite even the presence of higher PCB concentrations.” This particular study demonstrated a strong inverse relationship between carotenoid intake as measured by blood levels and the risk of developing metabolic syndrome when exposed to PCB’s.
sleep deprivation for a single night leads to insulin resistance.

In one study of 11 healthy young men whose sleep was limited to 4 hours a night for 6 nights the body’s response to insulin dropped by 30%. Sleeping for 12 hours a night to compensate for the accumulated sleep debt restored physiology to normal.

In another study sleeping less than 6 hours a night doubled risk of developing diabetes over a 15 year period while sleeping more than 8 hours a night tripled risk of developing the disease. The increased sleep time would tend to include the population with sleep apnea as these individuals are always tired.

REFERENCES:


Yaggi, H. Klar, et al., Sleep duration as a risk factor for the development of Type 2 diabetes, Diabetes Care, 2006;29:657-661.

INFLAMMATION

Research shows that chronic inflammation in fat plays a crucial role in the development of obesity-related insulin resistance. An omega-3 supplement developed by the NeoLife company was shown to reduce the inflammatory index by 68% in 8 weeks. There was also a 17% reduction in triglyceride levels. Both of these changes could be expected to reduce the risk of insulin resistance.

REFERENCES:


WEB RESOURCES

www.imageawareness.com
www.yourbodysignlanguage.com
www.jimmcafee.com

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