

modern lifestyle with easy access to manufactured foods laden with sugar. Our sugar consumption has increased exponentially over the last sixty years. Much of it is promoted by the fast food industry. Sugar is addictive and helps to boost the sale of food products.

But there is another mechanism that may have contributed to excess sugar consumption.

Studies have shown that psychological stress produces stress hormones, such as cortisol and adrenaline, that may interfere with the synthesis of a neurotransmitter, **serotonin**.

Serotonin is the main 'feel-good' neurotransmitter in the brain. An imbalance of serotonin in the brain can cause **endogenous depression**. Doctors usually prescribe **Selective Serotonin Reuptake Inhibitors** (SSRIs) for endogenous depression. These drugs increase serotonin by blocking its reabsorption in the brain and so may reduce depression. The body produces serotonin from **tryptophan**, an essential amino acid (protein unit) found in food, such as soya protein, cottage cheese milk and many others. See **Rich Sources of Nutrients** at the web site.

The absorption of tryptophan from food has to compete with the absorption and digestion of other amino acids - such as phenylalanine. Most amino acids (including glucose) - but not tryptophan - are transported into cells for utilization via the action of insulin! The absorption of tryptophan for conversion to serotonin can be sped up by consuming refined carbohydrates, such as sugar.

Increased sugar consumption has the effect of triggering the release of insulin from the pancreas. This helps to absorb all the amino acids (including glucose) - but not tryptophan - leaving tryptophan free for absorption.

Unfortunately, people who are depressed may be inclined to increase their sugar consumption. **This will speed up absorption of tryptophan for conversion to serotonin with the help of vitamin B6 and magnesium and presto they feel happy!!!** But this may precisely lead to 'sugar addiction' and hypoglycemia!

Many depressed people, including those with an addiction problem have been found to have a history of sugar-addiction.

A high sugar diet, however, will cause the body to 'down-regulate' receptors for insulin in the membranes of cells. This means the cells will fail to respond to normal levels of insulin and eventually show "**insulin resistance**". The body will try to compensate for this through what is called the hypothalamic-pituitary-adrenal axis (the HPA axis). This means in response to the perceived energy starvation by the hypothalamus in the brain, a message is sent to the adrenal glands to secrete **adrenaline** into the blood stream. This hormone functions to convert glycogen stores in the liver and muscles into glucose, so as to quickly raise blood glucose levels. But adrenaline is also the fight/flight hormone readying the body to face the dangers of life by pumping energy into muscles and the brain. This panic hormone is also responsible for the myriad of hypoglycemic symptoms, such as tremble, shakes, mood swings, depression and confusion. Some people have learned that taking sedating drugs such as alcohol, marijuana or benzodiazepines will temporarily give relief to these symptoms. But these can lead to addiction.

So we see that there is more to hypoglycemia than meets the eye.

If you want to join the Association please ask the Secretary to send you a free copy of a Newsletter and then join

The Hypoglycemic Health Association of Australia

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by completing the application form at the back of the Newsletter

Overseas members by email only.

What is Hypoglycemia?

by

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see also our web site at:

<http://www.hypoglycemia.asn.au>

Hypoglycemia means 'low blood sugar level'. This term is used to describe a metabolic disorder, that may manifest itself in a variety of physical and 'psychological' symptoms. One must understand that glucose is a source of both physical (i.e., muscles) and mental (brain) energy. The brain although only 2 per cent by weight of the body, requires between 50 and 60 percent of the available glucose in the body, whether awake or asleep. Many doctors believe that hypoglycemia is due to 'insulin resistance', which it shares with diabetes. Insulin functions to transport glucose, amino acids and fatty acids across cell membranes into cells. In diabetes there is a more severe failure for body cells to respond to insulin, which results in high blood sugar levels that can be very damaging to the health of the person.

The proper test for hypoglycemia is a special **Glucose Tolerance Test (GTT)** designed by Dr George Samra and described in his book **The Hypoglycemic Connection II**.

Unlike a test for diabetes, Samra's GTT records the measurements of glucose levels after a load of glucose **over time**, usually over four hours taken each half hour. He is interested in the **rate** of variations - the rise and fall of blood glucose during the test. This enables the doctor to discern six types of hypoglycemic reactions in a GTT as described in his book.

These are:

Type 1, Relative Hypoglycemia. Following ingestion of glucose the blood sugar level rises unusually high (due to insulin resistance) and then suddenly drops. The rate of descent should be over 2.6mm/L (45 mg/100mL) in any hour, or over 1.6mm/l (30mg/100mL) in any 1/2 hour.

Type 2, Absolute Hypoglycemia. This is any blood glucose recorded below the lower limit of 3.4mm/L (60mg/100mL).

Type 3, Combined Hypoglycemia. This is also known as 'Reactive Hypoglycemia'. Here the blood sugar level not only drops suddenly, but goes below the lower limit.

Type 4, Flat Curve Response. Where no blood glucose value is more than 1.3 mm/L (24mg/100mL) above the fasting level. This may be due not so much to a reaction to sugar, but a low metabolic rate. People with a Flat Curve Response should have their thyroid tested, for possible hypothyroidism. It is often indicated by low body temperature in the morning. If you measure your temperature before getting out of bed and you get a reading below 36.2 C. or 97.6 F. one should discuss this with your doctor. Vitamin B1 plays a role in the production of thyroxine, as does phenylalanine and tyrosine (the latter is the immediate forerunner of thyroxine). Thyroxine is also needed in the conversion of beta-carotene to vitamin A.

Type 5, Fasting Hypoglycemia where the fasting blood sugar level is below 3.4 mm/L (60 mg/ 100ml)

Type 6, Cellular Level Hypoglycemia This is energy starvation at the level of brain cells. The person may have a normal GTT but presents the same hypoglycemic symptoms. This may be caused by a dysfunction in enzymes involved with glucose metabolism, usually as a result of an abnormal zinc/copper ratio. Zinc is a coenzyme in the break down of glucose to simpler biochemical substances, before being used as energy inside brain cells. High copper levels depress zinc levels and vice versa.

Other coenzymes and vitamins are also involved in glucose metabolism inside the mitochondria.

In hypoglycemia insulin resistance is less severe, but it means that the body tries to compensate by producing more insulin - called **hyperinsulinism** - to push nutrients into cells. But too much insulin means that glucose supplies may suddenly crash to low levels. Normally glucagon from the pancreas raises the sugar levels. But when the blood sugar level suddenly descends, the brain will be starved of energy, and will send a message to the adrenal glands to secrete adrenaline. This stress hormone converts glycogen stores (in the liver and muscles) back into glucose, thereby raising the blood glucose concentrations. Adrenaline as well as cortisol (another stress hormone) are responsible for the many 'symptoms' of hypoglycemia, such as nervousness, palpitations, sweating, trembles, headaches, anxiety, depression, tiredness, memory impairment and history of sugar addiction.

The wild fluctuations of high and low glucose concentrations in the blood may produce 'mood swings', but more importantly will affect energy levels in the brain at the level of brain cells themselves. Dr George Samra calls this "**cerebral hypoglycemia**" indicating starvation of brain energy.

Another aspect often overlooked is that high levels of insulin blocks the utilization of fat cells (adipocytes) for energy production, and this may be responsible for the fact that people with insulin resistance often are overweight. In addition, studies are emerging that high levels of insulin (hypoglycemia) dumps magnesium in the urine upsetting the delicate balance between intracellular magnesium and calcium ions, affecting blood pressure. Thus we see that hypoglycemia is part of Syndrome X defined as a cluster of symptoms of insulin resistance, high blood pressure, hyperlipidemia and obesity.

Many patients with **Candidiasis** (food sensitivities to yeast, beer, bread) as well as sufferers of **Chronic Fatigue Syndrome** have been found to suffer from hypoglycemia.

Nutritional Treatment

- 1) **Avoidance of sugar**, coffee, strong tea, nicotine if possible, refined carbohydrates, such as white bread, white rice, cakes and sugary drinks, colas etc.
- 2) high **protein snacks every three hours** or sooner, to provide a slow release of glucose, and to prevent a hypoglycemic dip.
- 3) A high protein breakfast must be considered the most important meal of the day. **Supplementation** of the diet with antistress B complex vitamins tablets, including **chromium, zinc + vitamin C**.

A rule of thumb is: "Is what you are about to eat nature-made or man-made?" Nature-made foods consists usually of complex carbohydrates and proteins, the kind of food we were meant to eat. There are exceptions, such as sugary fruits; melons, honey, dates and bananas. These can be reintroduced into the diet after some time and in moderation.

When you change your diet suddenly, you may be left with low blood sugar levels, without the highs, experiencing depression, fatigue and worsening the symptoms initially. These are withdrawal symptoms, that should not last longer than a week or so. Nevertheless, these unpleasant feelings can be alleviated by taking a table spoon of **glycerin** mixed in a glass of milk or diluted natural fruit juice three times a day. Or better still mixed in a glass of water with a dash of lemon juice to improve taste. When glycerin is metabolised into 'energy' , it bypasses glucose and is therefore not recognized by the pancreas as sugar. It acts as a primary fuel for the brain.

ALLERGIES are closely related to the hypoglycemic syndrome. For instance, many **asthmatics** have improved their condition by adopting the hypoglycemic diet so as to fortify their immune system. The vast topic of allergies influencing diseases such as arthritis, eczema, bowel disorders, depression and fatigue is fully covered in Dr George Samra's book: **The Allergy Connection; Food and Disease Paradigm**, One Stop Allergies Kogarah NSW Australia (Fax 612-9588-5290)

Let me quote from page 1:

"The Food and Disease paradigm argues strongly that rather than using drugs as a first line of treatment, *a diet change based on common food triggers should be tried first*, with or without alternative treatment modalities. For example, someone suffering from migraines should be taught to avoid chocolate, cola drinks, oranges, peanuts, cow's milk products, green beans and peas, and MSG code 621 - these are the **commons** for migraine sufferers"

What's in a name

As described previously, hypoglycemia means low blood sugar level. This is the common term used by people who suffer from the hypoglycemic symptoms. Unfortunately, this term causes immediate confusion for conventional doctors who understand hypoglycemia to be low blood sugar occurring in diabetic patients who have accidentally overdosed with their insulin injections.

However, if we consider the condition in terms of 'insulin resistance' the difference between diabetes and hypoglycemia is one of degree. In diabetes we have high blood sugar concentrations, whereas in hypoglycemia we see wildly fluctuating sugar levels, depending on the severity of insulin resistance.

If you want to research hypoglycemia in the medical scientific literature, you have to look for terms like hyperinsulinism, hyperglycemia, insulin resistance, Syndrome X, diabetes and so on.

Many nutritional doctors use the term **Dysglycemia**. It is possible that in the near future the medical fraternity may agree on a term.

There is no doubt that the impact of hypoglycemia is underestimated by the community. There are studies to show that hypoglycemia is associated with a vast array of modern degenerative diseases, from atherosclerosis, arthritis, various bone diseases, heart diseases, in fact every organ found in the body.

Mental disorders

The impact of hypoglycemia on mental illness is not generally appreciated.

The World Health Organization (WHO) Global Burden of Disease Survey estimates that mental disease, including stress-related disorders, will be the second leading cause of disabilities by the year 2020.

Over the last few years studies have appeared in the medical literature connecting depression, alcoholism, bipolar disorders, anxiety & panic disorders, obsessive behaviour and criminal behaviour with the hypoglycemic syndrome.

Please look up;

"The Research Evidence for Hypoglycemia" at our web site at:

<http://www.hypoglycemia.asn.au>

The Serotonin Connection

One obvious reason for the development of hypoglycemia and diabetes is our