Obesity and type 2 diabetes are related worldwide epidemics which could be erased with the help of governments and medical communities using tools that are readily available today. Prevailing diet recommendations, which are clearly wrong, are a significant cause of both obesity and type 2 diabetes and have led to the current dire situation. According to the CDC, in the United States alone there are currently 34.2 million people with diabetes of which 30 million have type 2 diabetes. In addition, 88 million Americans have prediabetes (defined as an A1c above 5.7%) which will almost certainly progress to type 2 diabetes if not treated and reversed. The cause of insulin resistance, prediabetes and type 2 diabetes is “glucose toxicity” as explained below, and understanding this medical term is paramount to the case against using insulin for type 2 diabetes.

Glucose reacts with all the proteins in the body leading to insulin resistance and type 2 diabetes. Unfortunately, nearly 20% of adults with type 2 diabetes are prescribed insulin injections often in conjunction with oral pharmaceutical medications. Because people with type 2 diabetes have insulin resistance, prescribing insulin is a very bad idea, since they will need an ever-increasing dosage of insulin as time passes, leading to a lifetime of insulin injections. There is only one product, Lysulin (www.lysulin.com), that targets the cause of insulin resistance and has been proven in double blind, placebo controlled clinical studies to improve insulin resistance and beta cell function. The recommend initial treatment for type 2 diabetes should be moderate exercise, intermittent fasting, a low caloric, low carbohydrate ketogenic diet combined with Lysulin before instituting insulin therapy for type 2 diabetes. By adhering to a ketogenic diet that includes moderate exercise, intermittent fasting and nutritional supplementation with Lysulin, diabetes can be halted and quite possibly reversed. Lysulin is a patented nutritional supplement that contains lysine, zinc, and vitamin C [1]. Double-blind placebo-controlled clinical studies have shown the effectiveness of this nutritional supplement [2, 3].

Why do humans need glucose? Glucose is essential in providing the human body its’ energy needs. Glucose relies upon the hormone, insulin, to enter our cells thereby producing the energy we need for everyday living. However, while everyone needs a certain amount of glucose for daily energy production, excessive glucose is dangerously toxic to the body (primarily because of protein glycation). In addition, fructose (from High Fructose Corn Syrup) does not utilize insulin to enter the liver or our cells, and thus enters them easily and immediately turns into fat [4]. Poor diet and the consumption of High Fructose Corn Syrup (HFCS) has resulted in the obesity and diabetes that we see all around us today. The pandemic of type 2 diabetes-expected to affect at least 250 million people worldwide by 2020 and 642 million by 2040 [5, 6] is the result of our excessive carbohydrate, High Fructose Corn Syrup, and sugar-infused diet (and the lack of commensurate exercise). This leads to insulin resistance, caused by the glycation of insulin and insulin receptors, thereby resulting in high concentrations of glucose in the bloodstream [7].

The therapy for type 2 diabetes starts with attempts to control glucose through diet and exercise. If this fails, oral drugs are prescribed. If oral drugs do not work, insulin injections are used. Approximately 20% of people with type 2 diabetes are using insulin injections to control their blood glucose levels [6]. These patients are doomed to a lifetime of insulin shots requiring more and more insulin.

There is vast literature documenting the role of nutraceuticals in the management of alterations in metabolism [8].

Protein Glycation

Glucose is toxic, like a poison, because it is a reactive chemical. Glucose is an aldehyde which reacts with the amino groups found on the amino acids of all proteins in the body which forms a fructosamine bond, and the protein is said to be “glycated”. These glycated proteins progress through a series of reactions to become Advanced Glycation End products or AGEs [9]. AGEs are believed to be responsible for many (and perhaps all) of the disease complications associated with diabetes. These include retinopathy, nephropathy, and neuropathy (which leads to blindness, kidney failure, organ degradation, and amputations.) [10]. The glycation of insulin and the insulin receptors on our cells leads to insulin resistance and, in turn, insulin depletion [10]. Figure 1 illustrates how this happens. This logically leads to this observation: If protein glycation could be slowed or halted, the complications of diabetes would be reduced or stopped and the progression of prediabetes to type 2 diabetes would also be slowed or halted. Because lysine has been shown in animal models of diabetes to halt the production of AGEs [11], it is one of the remedies that could slow or halt the complications of type 2 diabetes.
Insulin Depletion

In normal individuals, insulin production can respond to the insulin needs for the length of a person’s lifetime. With chronic hyperglycemia, the pancreas makes more insulin in an attempt to normalize blood glucose. When burdened with insulin resistance, our pancreas is called upon continuously to make more and more insulin in a heroic attempt to lower blood glucose. Constantly high levels of glucose in the blood, i.e., glucose toxicity, eventually exhausts the ability of the pancreas to make more insulin. When the pancreas gives up and can no longer make insulin, or adequate amounts of insulin, it becomes necessary to take insulin shots to make up the shortfall.

The Natural Solution to the Problem of Glucose Toxicity

Addressing glucose toxicity should be a high priority in preventing and treating type 2 diabetes, its complications, and associated diseases. A promising approach to inhibiting protein glycation is through consumption of a nutritional supplement with the tradename Lysulin®. Lysulin contains lysine, zinc, and vitamin C [1]. Lysine is an amino acid (building block of protein) and has long been used in medicine to treat and even prevent cold sores (caused by the virus called herpes simplex labialis). Lysulin has been shown to halt AGE production in diabetic rat studies [11]. Now, recent double-blind placebo-controlled studies have shown that Lysulin can lower HbA1c in as little as two weeks [12]. A study with patients with prediabetes concluded that Lysulin improves insulin resistance and halts the progression from prediabetes to type 2 diabetes [3].

Because Lysulin contains a safe, but relatively large dosage of the amino acid lysine, it blocks protein glycation as illustrated in (Figure 2). The lysine in Lysulin reacts with glucose and thus protects your proteins from this reaction. The glycated lysine is then safely excreted in the urine. Lysulin also contains zinc and vitamin C, both of which have been shown to lower blood glucose and prevent the progression of prediabetes to Type 2 diabetes and improve insulin resistance and the lipid profile [13, 14]. The combination of zinc and vitamin C with lysine creates the results being reported in the lowering of HbA1c for patients with prediabetes [3] and type 2 diabetes [2]. A recent publication compares Lysulin performance compared to current type 2 drug therapy [15]. Additional clinical studies are underway to confirm initial findings.
**Conclusion**

The world is suffering a pandemic of obesity and type 2 diabetes largely related to poor diet and nutritional deficiencies. A surplus of glucose in our bloodstream, stemming from chronic and excessive carbohydrate and HFCS consumption, is proving to be highly toxic to hundreds of millions of people worldwide. This has led to excessive protein glycation, AGE production, insulin resistance, insulin depletion and ultimately fatal disease complications. A natural nutritional supplement, Lysulin, now offers a unique, effective, and affordable way to combat glucose toxicity and the diabetes pandemic. Lysulin should be used before type 2 drugs since it has shown great benefit without adverse events or side effects. This is especially true for insulin therapy for type 2 diabetes.

**References**


6. Centers for Disease Control and Prevention (CDC), National Center for Health Statistics, Division of Health Interview Statistics, data from the National Health Interview Survey. Data analyzed by personnel in the CDC’s Division of Diabetes Translation, National Center for Chronic Disease Prevention and Health Promotion.


**Copyright:** ©2021 Burd JF. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.