An Insulin-Friendly Lifestyle for Optimal Health and the Prevention of Hyperinsulinemia, Metabolic Dysfunction, and Insulin Disease

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ABSTRACT

Elevated insulin levels and suppressed glucagon have been linked as leading causes of chronic disease and metabolic dysfunction. An "insulin-friendly" lifestyle ("IFL") can optimize wellness and prevent hyperinsulinemia which leads to metabolic dysfunction and chronic diseases. In a two-year continuation study (2016-2018), an adult male followed an IFL designed to control insulin levels and activate glucagon. Methods for an insulin-friendly lifestyle outlined in this paper included a balanced diet of whole real natural foods, the consumption of healthy beverages, daily exercise, and stress management. No medications or supplements were used. The subject underwent a variety of medical tests to determine his general health and metabolic function. The results showed that an IFL optimized wellness, prevented hyperinsulinemia, and reduced the risks of chronic disease. The subject maintained a normal weight and waist-to-height ratio. Test results were within normal ranges for fasting and postprandial insulin and glucose levels, HbA1c, CRP, HDL, triglycerides, liver function enzymes, and other risk markers. By controlling insulin, the subject was able to activate glucagon and generate signaling pathways involved in the body's repair, autophagy, longevity, and survival mechanisms. The study concludes that individuals who follow an IFL can enjoy optimal health and vitality. Furthermore, governmental institutions and national associations adopting a policy of IFL promotion can optimize the health of the population, reduce health care costs, and improve treatment options for those already suffering with chronic disease.

Keywords: Fatty Liver, Glucagon, Hyperinsulinemia, Insulin, Insulin Resistance, Metabolic Syndrome

I. INTRODUCTION

Elevated insulin levels and inactive glucagon have been identified as a leading cause of chronic disease and metabolic dysfunction.[1] In a previous study beginning after 2008, a 56-year-old male followed an insulin-friendly lifestyle (IFL) to improve his health. The subject lost 30 kg, maintained basal metabolic rate, and reduced markers associated with the risks of chronic diseases.[2] In this continuation study from 2016 to 2018, the same subject, now 66 years old, continued to follow an IFL to assess its effectiveness in maintaining a healthy weight and overall wellness, and in reducing risk factors associated with the onset of chronic diseases.

The goal of this continuation study was to determine the efficacy of controlling insulin and activating glucagon by following an IFL to promote wellness and to reduce the risks of metabolic dysfunction and chronic disease. The benefits of modulating these hormones were summarized in a 12-hour video produced in 2014 by this author (who is also the subject in this study). The video reviewed opinions by medical doctors, researchers, and professors from all over the world.[3] These medical experts presented data showing that chronically-elevated insulin, called hyperinsulinemia, leads to metabolic dysfunction, inflammation, adipokines, oxidative stress, advanced glycation end-products (AGEs), elevated blood pressure, non-alcoholic fatty liver disease (NAFLD), elevated glucose levels, hormone imbalances, weight gain, fat storage, inhibition of glucagon signaling, visceral fat, metabolic syndrome, and insulin resistance. This author refers to all the aforementioned conditions, collectively, simply as "insulin disease." Focusing on prevention, the video discussed ways to lower insulin levels, activate glucagon, lower triglycerides, boost high density lipoprotein levels (HDL), lower blood sugar, and prevent chronic diseases such as hypertension, heart disease, diabetes Type 2, obesity, liver disease, Alzheimer's, cancer, Polycystic Ovarian Syndrome (PCOS), macular degeneration, all of which were characterized in the video as being just one disease with different names and occurring in different parts of the body. Numerous studies have reached similar conclusions, finding hyperinsulinemia a leading cause of cardiovascular disease;[4] the metabolic syndrome;[5] the unifying theory of chronic disease;[6] and, the driving force behind diabetes Type 2 and heart disease.[7]

Given insulin's central role in metabolic dysfunction, this study focused on whether or not following an IFL can promote wellness, reduce risk factors associated with the onset of chronic diseases, and activate glucagon in order to stabilize energy metabolism, promote healthy gene expression and signaling pathways, improve mitochondria function, and balance other hormones.

II. METHODS

The subject followed an IFL which included a balanced diet, healthy beverages, daily exercise, and stress management. The diet was composed of whole real natural foods and beverages which were minimally processed and free of such things as artificial additives, growth hormones, antibiotics, pesticides, and GMOs. The subject ate twice a day (generally mid-morning and late afternoon). Foods were selected and prepared to maximize nutrition, to have a low glycemic load, and to have a low impact on insulin. At every meal, the subject enriched the meal with certain whole foods which were high in fat-soluble vitamins (A, D, E, and K2), Vitamin C, trace minerals, fiber, and phytochemicals. Macronutrients were split in proportion to the six food categories as shown in Figure 1. The foods included whole grains, beans (except soy), tubers, avocados, nuts, seeds, fruits, vegetables, dairy products, and animal products. No attempt was made to weigh or measure portions and calories, nor to determine any exact ratio among the macronutrients

other than to follow the relative size of each food category as shown in Figure 1. Most foods were from local sources and seasonal. Grains and seeds were soaked and fermented, especially for making a sourdough 100% whole grain and seed bread shown in Figure 1. Fermenting the bread reduced the natural sugars and maximized nutrition. Each meal included probiotic-rich homemade fermented vegetables (made out of beets, cabbage, and bell peppers), plain yogurt and cheese, and fermented beans. Beverages consisted of ozonated water (ozone removes glyphosate and many other pollutants), tea, coffee (with homemade fresh almond milk), and fermented juices. Alcohol use was very rare. Daily exercises included an hour of swimming every morning before breakfast in a chlorine-free ozonated pool (kept cold to stimulate brown fat cells), fast walks, and some resistance training. Stress management included socializing, walking, studying challenging new subjects, listening to music, watching old movies, getting adequate sleep, and minimizing inflammatory factors such as heavy metals, EMF radiation (including blue light), and poor dental hygiene. Sunlight was the main source of Vitamin D and other metabolites. No medications or supplements were included. The subject abstained from all refined sugars, processed flours (effectively excluding more than 99.99% of all grain products), and processed foods which the author believes are stripped of natural fiber and nutrients, and which allow simple sugars to be absorbed too quickly into the blood stream (causing insulin spikes) and the creation of glycation end-products. The subject avoided industrial vegetable and seed oils (PUFAs) subjected to high heat, pressures, and solvents to minimize oxidized fatty acids which cause inflammation, damage to cell structures, and atheromatous plaques.[8] The target Omega 3 to Omega 6 ratio was one to one. A top priority was modulating insulin and glucagon in order to signal the body's repair, autophagy, and survival mechanisms (discussed below).

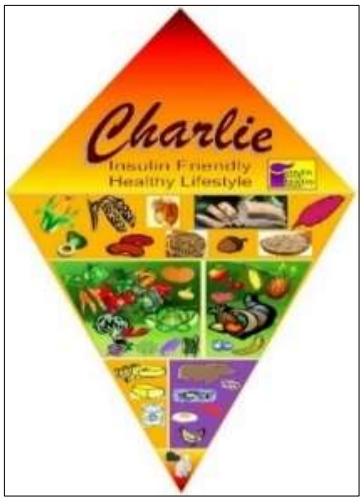

Fig. 1. IFL Friendly Foods

Fig. 2. Ozone for Drinking Water and Swimming Pool

While not formal participants in the instant study, the author wishes to mention three ladies, ages 30, 37, and 55 respectively, who adopted an IFL for a brief period of time within the past year and who were in being counseled by the author of this study. These three ladies followed the IFL to varying degrees and lengths of time, often eating two meals a day and staying active by either working in the field or doing some exercises.

As much as possible, the IFL was designed to be in harmony with the Laws of Nature (to the extent mankind's knowledge has evolved) and the building blocks of life itself as profoundly explained in Quantum Field Theory (QFT). At the fundamental level, QFT teaches that particles are but excitations, ripples, in quantum fields … fields which have shaped and defined human evolution. These fields interact to form electrons, protons and neutrons (from quarks), atoms, molecules, and cell structures in a sea of quantum foam in the "vacuum" of existence. Being "friendly" to insulin would naturally call for a lifestyle which is in accord with these building blocks of Nature. Maintaining the well-being of the electron transport chain, the production of ATP, the synthesis and repair of DNA, the integrity of telomeres and cell receptors, etc., are all biological processes which require considering how a given activity (be it selecting, preparing, or consuming certain foods or beverages, exercising, or managing stress) impacts insulin and glucagon. Staying as close as possible to what is natural and preserving the delicacy and coherence of the quantum fields and life-giving molecules defined the IFL followed in this study.

III. RESULTS

Adopting an IFL optimized wellness, prevented hyperinsulinemia, and reduced risk factors associated with metabolic dysfunction and insulin disease. There were no signs of the metabolic syndrome (a cluster of conditions which includes high blood pressure, high glucose levels, visceral fat, low HDL, and elevated triglycerides). Tests for fatty liver were negative. The subject's weight (72 kg) and waist-to-height ratio (1/2) remained within normal ranges. Levels of fasting and postprandial insulin and glucose, measured each hour over a four-hour period after eating a typical IFL meal, were normal. Tests for inflammation, glycated hemoglobin, liver function enzymes, echocardiogram (EFLV 70%), coronary artery calcium scan (CAC score: 2), blood pressure (106/56), and heart rate (54) were all within normal ranges. Taken together, the results showed evidence of physiological adaptations to the composition, type, and timing of meals and exercises. Figure 3 shows actual results of laboratory values in this study as compared with the subject's journey to better health starting in 2008 to the present. Figure 4 shows test results of fasting and postprandial levels for insulin and glucose following a morning swim and later IFL meal.

Test	2008	2014	2016	2018
HbA1c %	N/A	5.3	5.2	5.2
CRP mg/l	N/A	0.95	0.69	0.89
TG mg/dl	129	42	63	81
HDL mg/dl	35	56	53	50
AST (SGOT)	36	20	22	21
ALT (SGPT)	50	16	18	16
Fatty Liver	Mild	Neg	Neg	Neg
CAC Score	N/A	N/A	N/A	2

Fig. 3. Blood Tests & Scans

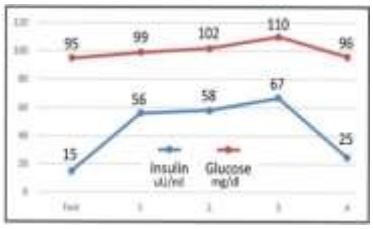

Fig. 4. Insulin and Glucose Levels

Fig. 5. Subject in 2008 versus 2018

As for the three ladies who tried the IFL, the results were as followed: The younger two ladies each lost 3 kg (from 57 kg to 54 kg and 54 kg to 51 kg, respectively). Neither lady was aware or suffered from any discernable health problems other than that both just wanted to lose a "little weight." After reaching their target weight, both ladies relaxed their efforts to follow an IFL in a strict manner. Both explained that she wanted to resume eating whatever and whenever they wanted. Each followed the IFL for about 3 months and lost approximately 1 kg per month. As of this writing, both have regained some of their weight, but have integrated many of the IFL concepts into their daily lives and report they intend to resume following an IFL and its core suggestions for the rest of their lives. The oldest lady (aged 55 and mother of two grown children) has been following an IFL for 5 months, as of the date of writing this paper, and has lost 5 kg (from 76 kg to 71 kg) - also about 1 kg per month. Previously, she reported various health issues, including obesity and diabetic pathology with fasting glucose levels in the 180 to 200 mg/dl range. Although a full medical exam was not conducted at the start of her adopting an IFL due to the informal nature of her initiating the new lifestyle (for example, she did not attend any seminars or stock all the IFL foods and beverages one would normally want to have available to follow an IFL), she has shown some good results. As of this writing, she reports an increase in energy, regularity, stamina, and overall enthusiasm for an IFL. During a recent health check-up, her doctor told her that her fasting blood sugar level was 88 mg/dl and had succeeded in losing weight. It is hoped that a formal study of these three ladies can be implemented next year

IV. DISCUSSION

A review of the male subject's medical tests showed that following an IFL promotes wellness, minimizes metabolic dysfunction, and reduces the risk of chronic diseases. An IFL provides optimal nutrition and gut health, both important factors in maintaining energy levels and controlling cravings in between meals, helped in no small measure by a healthy microbiome of intestinal bacteria and other organisms which an IFL provides. An IFL lowers both the level of insulin and the length of time it remains elevated. Low levels of insulin activate glucagon which directly or indirectly stimulates repair and longevity signaling pathways. Glucagon acts like the director of a "metabolic" symphony which orchestrates intricate signaling pathways, other hormones (such as leptin and ghrelin), gene expression, enzymes, transcription factors, and biological reactions involved in cell repair and organ function. The idea of glucagon and the metabolic symphony working together is this author's concept he calls the "GG effect," or simply "GG" for short. In summary, GG stands for a cascade of survival mechanisms initiated during times when insulin is low (normally because food is not, intentionally or unintentionally, available and because other lifestyle factors together are activating glucagon). The survival mechanisms include releasing energy from fat, maintaining energy levels by keeping basal metabolic rate stable, repairing DNA and cellular organelles, and activating longevity metabolites. The GG effect occurs only when insulin is low. Biologically, the pancreas senses low insulin levels and releases glucagon into the blood, which in turn activates all the other survival mechanisms. GG recycles damaged proteins and cells (autophagy), repairs useful cells and enhances mitochondrial function,[9] removes visceral fat from the heart, liver, pancreas, and other organs, and helps these organs function normally. GG can act like a powerful natural medicine and, in many cases, the only "medicine" available to treat fatty liver, visceral fat, obesity, metabolic syndrome, and insulin resistance.

Fig. 6. GG Metabolic Symphony

GG reduces inflammation of the cardiovascular system by lowering the number of modified "sdLDL" particles (dangerous oxidized and glycated remnants of the larger buoyant LDL particles). Research shows that atherosclerosis (a condition in which plaque builds up inside the arterial walls) is not caused by dietary cholesterol or by healthy LDL particles, but by the body's immune response to modified sdLDL particles,[10] which generate an inflammatory response by macrophages leading to plaque formation if not quickly removed.[11] Many medical experts believe that failing to discriminate between healthy LDL particles and modified sdLDL as the cause of heart disease is a fundamental error of modern medicine and has led to unnecessary and unsuccessful treatments. They cite studies showing that 50% of all heart disease incidents involve patients with "normal" LDL cholesterol levels.[12]

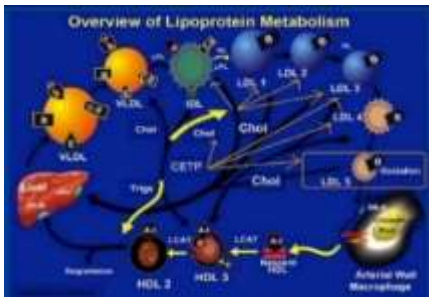

Fig. 7. Modified sdLDL (by Ken Sikaris)

Controlling insulin and activating GG helps maintain organ function and balance hormones. For example, women can prevent PCOS by modulating insulin and GG to balance the hormones estrogen, follicle stimulating hormone (FSH), luteinizing hormone (LH), progesterone, and testosterone, the imbalance of which can lead to PCOS,[13] problems relating to fertility, and even risks of diabetes and obesity to children of insulin-resistant mothers. Men can prevent Penile Erectile Dysfunction (PED) by keeping their cardiovascular system healthy. Similarly, GG can preserve the microvasculature of the heart (IV Septum), kidneys, and brain, protecting it from Alzheimer's disease (which some doctors call Type 3 diabetes)[14] by repairing and recycling proteins and fats essential for cognitive function. GG can prevent many cancers, too, because many medical experts believe it to be driven by metabolic dysfunction.[15] GG prevents unregulated cells from proliferating by disrupting their access to nutrients such as glucose, glutamine (and other amino acids), and fatty acids. GG also inhibits the growth of blood vessels which feed

such rogue cells and targets them for destruction and recycling before they can spread.[16] New research also shows that cancer cells, when weakened by GG, are more susceptible to conventional cancer therapies. Can GG cure cancer? Well maybe, but not in the conventional sense. Cancer, or the unregulated growth of rogue cells, is occurring all the time everywhere in the body. Rogue cells, too small to be detected by any scan or missed by a biopsy, are always proliferating and causing mischief. In this author's opinion, no power on Earth can cure cancer as long as humans remain as breathing biological units. Only a vigilant immune system and a healthy metabolic constitution fostered by an insulin-friendly lifestyle can stop cancer from gaining a foothold and spreading throughout the body.

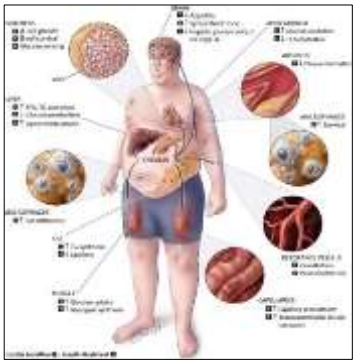

Fig. 8. Insulin Signaling (from the Rask-Madsen's Study)

GG improves the immune system not only to fight cancer, but to fight infections of all kinds, too. First, GG reduces AGEs which not only destroy cell membranes, proteins, receptors, etc., but also infection-fighting white blood cells. Second, GG recycles damaged immune cells and triggers stem cell-based regeneration of new immune system cells.[17] For those suffering from serious bacterial infections, GG not only boosts the body's immune response, but it also weakens bacteria which thrive on glucose but suffer on ketones. Such weakened bacteria are much more susceptible to antibiotics and other traditional treatments.

GG helps with weight control, too. In order to lose weight permanently, in a healthy manner, activating GG is a prerequisite as only it can release stored fat for use as energy. Balancing insulin and glucagon is the key, as experienced by the three ladies who adopted an IFL (each losing about 1 kg per month). "Eating less and exercising more" is not the answer; it just leads to frustration and failure - a "cruel hoax" as one medical doctor called it.[18] Activating GG is the solution. Actually, an enzyme called Hormone-Sensitive Lipase (HSL) inside the adipose cells is a main actor. It releases free fatty acids from triglycerides stored in the fat tissues. But, HSL only releases the stored energy from fats when insulin levels are low and GG is active, i.e., only when HSL cannot sense that insulin is elevated. Chronically-elevated insulin levels inhibit HSL, leaving those who want to lose weight feeling hungry, drained of energy, and seemingly gaining weight at the mere sight of food.[19] Why? Because in an insulin-resistant state, food and energy reserves (glycogen and triglycerides) cannot be tapped in a normal manner. In the abnormal state of insulin resistance, the liver transforms dietary carbohydrates into fat in a process called de novo lipogenesis.[20] While a healthy person with normal insulin function can metabolize carbohydrates for energy, the insulin-resistant person, eating the same amounts and kinds of food, will more likely than not convert such food into fat.[21]

Therefore, the first step in losing weight is to restore hormone balance and GG signaling. The greater the degree of insulin disease (fatty liver, insulin resistance, metabolic syndrome, inflammation, suppression of glucagon, etc.), the greater the need to control insulin, both its concentration in the blood and the length of time it is elevated. As with obesity and every other chronic disease, there are well-documented pathways explaining why hyperinsulinemia is the single most important factor driving metabolic dysfunction, no matter where the dysfunction ultimately manifests itself. The litany of chronic diseases are just symptoms and side-effects of chronically-elevated insulin levels.[22] See Figure 8, above, showing multiple areas of the body affected by insulin signaling.

GG is very effective in restoring liver function. Fatty liver is now recognized as an independent risk factor for diabetic pathology and cardiovascular disease.[23] As the adipose tissues fill up with fat (principally from de novo lipogenesis, the process of fatty acid and triglyceride synthesis mainly from excess carbohydrates as mentioned above), the fat cells end up sending the fat back to the liver, inundating it with fatty deposits. As the liver fills with fat, this excess fat engulfs the heart, kidneys, pancreas, etc., and also accumulates as inflammatory visceral fat, causing multiple metabolic dysfunctions throughout the body.[24] Experts estimate that in the United States greater than 30-40% of the general population have NAFLD and for those who are overweight or suffer from diabetes Type 2, the percentages of those with fatty liver are even higher: 60% for overweight individuals and 70-90% for diabetics. Research shows that it is the liver's inability to respond to insulin (insulin-resistance and NAFLD being one and the same) which causes elevated glucose levels in the blood, much the same way as a false negative feedback loop activates HSL in adipose tissues to free fatty acids while the liver sends triglycerides back to the fat cells in a never-ending cycle of "hot potato" lipoproteins (See Figure 9 highlighted in the 3rd segment of this author's 12-hour, 2014 video). The greater the metabolic dysfunction, the harder and longer GG must work to restore health. In other words, the time in between meals, along with other factors promoting an IFL, must be long enough to keep GG active, forcing the body to increase the use of ketones for energy. Some medical experts, such as Virta Health, have promoted "nutritional ketosis" to extend the time and level of ketones in the body.[25] They promote "ketogenic" meals which hardly elevate insulin at all and put patients into "nutritional ketosis" to extend the time and level of ketones in the body … successfully reversing Type 2 diabetes, fatty liver, and metabolic syndrome. Some may view their dietary recommendations as extreme, but they argue that such measures are effective and healthy. They have proven that even Type 2 diabetics on insulin can do away with their medications. While running on ketones and extending the time that GG is active is one hallmark of an "insulin-friendly" lifestyle, especially for those already suffering from metabolic

Fig. 9. Never-Ending Cycle of TG and Fatty Acids

dysfunction, an IFL is unique in that it promotes a balanced diet and takes into account every daily activity which impacts insulin and activates GG in an effort to restore metabolic health and reverse fatty liver deposits and visceral fat. Is "nutritional ketosis" sustainable? Will it shorten one's lifespan? Only time will tell. An IFL, on the other hand, offers a variety of balanced foods, beverages, exercises, and stress management techniques and is designed to last a lifetime using a multi-factorial approach focusing on controlling insulin and activating GG.

As with any lifestyle, the question of willpower and self-discipline must be addressed. Generally, resolutions to start a healthy lifestyle fail sooner than later. But, following an IFL can help. When every cell in the body is functioning normally and the mitochondria are supplying energy at optimal levels, sweets and junk foods lose much of their appeal and the body naturally chooses a healthy lifestyle. The senses seek optimal nutrition and the body wants to move and exercise. The microbiome, supported by probiotic foods and absence of refined products, also plays a part – a huge part really as some refer to the gut as the "first" brain. As a practical matter, without a healthy gut, willpower and self-discipline are severely tested, if not absent all together. It is the natural balance between insulin and GG which causes one to follow a healthy lifestyle and which can offer a new lease on life. The "yoyo effect" of losing weight and gaining it back again stops. GG maintains normal organ function, energy levels, etc. GG, in many ways, is a "medical miracle" which can restore vitality and stamina, not only by slowing down the aging process, but even reversing it.

As miraculous as GG is, it needs time to restore health. Feeling younger and restoring the brain, heart, liver, kidneys, etc., is a slow process. Nothing happens instantly. Some functions improve within months, but the full power of GG can take years. It works slowly and naturally at the body's own pace. GG must help the body to adapt and restore metabolic function. This involves epigenetics by restoring such diverse functions as, for example, FOXO3a's DNA repair capabilities and restoring the insulin-producing Beta cells in the pancreas in diabetic Type 2 individuals. Only GG can reverse the "environmental factors" which led to Beta cell abnormalities and restore proper gene expression and signaling allowing the pancreas to start producing insulin again. GG acts throughout the body to restore autophagy, transcription factors, signaling pathways and cell receptors involving mTOR, leptin and other hormones, glucose, uric acid production, etc.

Learning the basics of an IFL takes time, experimentation, and evaluating medical opinions from doctors, researchers, and professors. Some of this journey involves combining different foods and beverages, learning how plants and animals are raised and what they are fed, paying attention to how foods are prepared and even the order in which one eats such foods. The goal is to maintain full nutrition and maximize the time that GG is active. Exercise routines play a vital role, not to lose weight per se, but at least to preserve, if not increase, lean muscle mass, lower insulin levels, improve insulin sensitivity, and maximize GG. Finally, managing stress is vital for health, although sadly for most, this is easier said than done. Stress has an enormous impact on insulin as it interacts with hormones like cortisol (the so-called "fight or flight" hormone). Many daily activities and interaction with the modern age impact insulin more than most would believe. Going without sleep, high EMF and blue light levels, gum disease and chronic inflammatory root canals, heavy metals, family and work issues, etc., all affect insulin levels. Focusing on insulin levels as part of an overall "insulin-friendly" lifestyle will have benefits that can last a lifetime.

Society and the Health Crisis

As this continuation study has shown, following an IFL can promote wellness, reduce metabolic dysfunction, and prevent chronic diseases. It can help control weight, restore liver function, and keep the cardiovascular system healthy. But, what can be done for the current worldwide health and obesity crisis? Extrapolating the individual results noted above, it may well be that nations adopting an IFL could take a giant step forward in the prevention of chronic diseases within their populations. Testing for hyperinsulinemia could virtually eliminate metabolic dysfunction and insulin disease in all its forms including visceral fat, insulin resistance, fatty liver, metabolic syndrome, inflammation, etc. Singling out and preventing insulin disease as the focus of national policy would have wide-ranging benefits. It could prevent all of the chronic diseases such as diabetes Type 2, hypertension, heart disease, cancer, obesity, Alzheimer's, PCOS, etc. Moreover, an IFL could help those already suffering from such illnesses by offering lifestyle changes and treatment strategies to improve the quality of life for all concerned (patients and caregivers alike). In many cases, as the doctors at Virta Health (above) have shown, metabolic diseases themselves can be cured, including Type 2 diabetes. Medical doctors and researchers across the globe have found that lowering insulin levels can cure diabetes Type 2 and restore pancreatic function, even for those patients on daily insulin injections. They submit that "chasing" rising glucose levels with medications has been a serious mistake. They do not accept the official characterization that diabetes Type 2 is a "progressive, chronic, and incurable disease" caused by a lack of insulin (as defined by the American Diabetes Association). On the contrary, they believe it is a curable disease which can be reversed by lifestyle changes which allows the pancreas to produce less insulin, and not chronically-elevated insulin levels which caused insulin resistance, fatty liver, diabetic pathology, and pancreatic dysfunction in the first place.

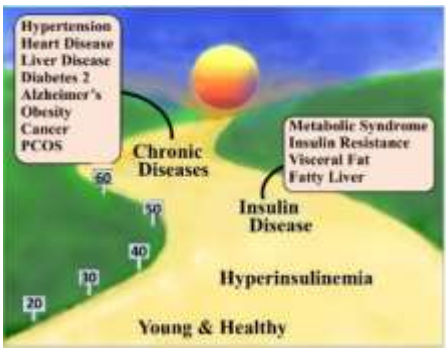

Fig. 10. In Time - Hyperinsulinemia to Insulin Disease to Chronic Diseases

Targeting hyperinsulinemia can reduce health care costs, too, by identifying those at risk of metabolic dysfunction at the earliest possible time. Many criticize the current medical system as merely managing chronic diseases with a "sick care" menu of procedures and medications. Managing chronic diseases not only fails to address the root cause, namely hyperinsulinemia and insulin disease, but also fails to detect a condition which could have been caught years, if not decades, earlier by simple diagnostic tests. Benjamin Franklin said it best, "An ounce of prevention is worth a pound of cure." Detecting insulin disease and preventing inflammation and cardiovascular damage long before such conditions manifest themselves as hypertension, heart disease, diabetes Type 2, obesity, PCOS, cancer, etc., is the prudent approach. Hyperinsulinemia as a marker is the perfect "early warning system" since it flashes on the "radar" screen long before other conditions appear. This gives patients and health practitioners a window of opportunity to adjust lifestyle factors, especially if national policy encourages healthy lifestyle habits with incentives such as special hospital privileges, tax incentives, etc.

Fortunately, there are a number of protocols for detecting hyperinsulinemia. One was developed years ago by Dr. Joseph R. Kraft, M.D. In a procedure called the "insulin assay," he tested insulin levels in over 14,000 patients. He recognized patterns which could detect abnormal insulin levels and "diabetic pathology." He found that over 75% of those tested suffered from metabolic dysfunction even though many had normal fasting glucose levels or oral glucose tolerance tests (OGTT) results.[26] Dr. Kraft believed that diabetic pathology was the cause of heart disease. He once said, "Those with cardiovascular disease not identified with diabetes … are simply undiagnosed." This is a very profound observation. While some question the wisdom of putting so much weight on an insulin test, given its pulsed oscillatory concentrations in the blood, there are others who claim that Dr. Kraft's insulin assay is the "most important health test" one can take, matching engineering precision.[27] Future studies would be helpful to improve insulin testing protocols. Currently, taking five blood samples, as the Kraft assay involves, is problematic. Some experts have suggested that taking only two samples might be enough (the 2nd and 3rd hours after an oral glucose challenge). Also, many people, including this author, prefer not to take "pure glucose" and instead test glucose and insulin levels following a typical IFL meal. Future tests might include taking a standardized IFL food challenge (such as a universally-recognized food plate, healthy bar, or dried fruit) which could serve the same function. For now, the insulin assay combined with other routine tests such as HDL, CRP, HbA1c, triglycerides, BMI, waist-to-height ratio, CAC score, sdLDL, abdominal ultrasound, liver enzymes, etc., and relevant ratios such as TG/HDL can do much to assess metabolic risks and form the basis of effective prevention strategies. As more data is assembled, it may be that the TG/HDL ratio, currently regarded as a risk marker for CVD and sdLDL particle levels, will correlate as well as a useful marker for insulin levels. Instituting routine testing, at the earliest possible age, would benefit everyone. Someday, it may be possible to use a non-invasive monitoring device to measure insulin levels similar to those under development for measuring glucose. Maybe glucagon and all the other blood markers noted above could be available, too. Hourly measurements, averaged over time, of insulin levels would allow real-time data of what activities are elevating insulin, suppressing glucagon, and inhibiting GG. Insulin is a veritable "Rosetta Stone" for interpreting the body's metabolic signals and a virtual crystal ball to help prevent hyperinsulinemia and all the diseases which eventually follow.

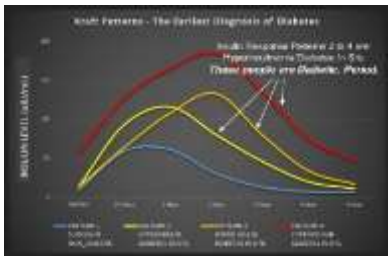

Fig. 11. Kraft Insulin Patterns

V. CONCLUSION

On an individual level, adopting an IFL promotes wellness and prevents metabolic dysfunction. On a national level, encouraging the population to follow an IFL may help solve the current health crisis. Focusing on insulin goes to the heart of what is a healthy lifestyle. Moreover, insulin levels are objective and politically neutral. Arguments over what foods or beverages to consume and in what ratios become moot. Faced with actual insulin test results, the definition of what is healthy becomes self-evident. Consumers faced with all manner of cookies, cakes, hamburgers, fried chicken, potato chips, instant noodles, ice cream, soda drinks and fruit juices made with added high fructose corn syrup, etc., would benefit by asking themselves a simple question, such as, are such foods insulin "friendly" or not? Educational programs, labels, consultations with health care professionals, etc., can help, too. When all is said and done, each person's insulin levels depend upon age, gender, health status, living conditions, environment, financial situation, etc. Focusing on insulin would be a step forward in building consensus and mitigating the confusing litany of diets championed by so many groups, often at odds with one another, including Low Carb High Fat, New Atkins, Plant-Based, Raw, Paleo, Primal, Ketogenic, DASH, Mediterranean, Traditional, Vegan, USDA Dietary Guidelines, etc. All of these diets share much in common, notably advocating whole foods as opposed to processed products. Such commonality is, unfortunately, lost by the vast majority of consumers who tend to just give up trying to figure out what is best for their health, eventually just following sophisticated marketing by the food and advertising industries. Given the diversity of cultures and vast differences in dietary choices, focusing on insulin may be the most useful common denominator. By focusing on insulin and an IFL, along with an understanding of the GG effect, individuals and nations alike can find common ground and join forces to tackle the personal and worldwide health crisis.

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