Cardiovascular Disease And Anti-Aging And Regenerative Medicines: A Revolution In Vascular Care

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Unprecedented changes in vascular surgery practice over the last twenty years coalesced in the endovascular revolution. In the course of this insurgence, we contemplated that gene therapy would supplant endovascular technologies. However, after phase three human gene trials and more than three billion euro squandered globally on research and development, all that we have attained is the realization that we are remote from any ground-breaking clinical outcome.[1] Equally the new kid on the block, cultured stem cell therapy has failed to deliver; its benefits are short-lived, it is costly to set up and we are a decade away from human relevance.[2]

Cardiovascular Anti-Aging programs are the contemporary frontier in functional metabolic vascular medicine. An entirely novel science of nutrigenomics has been born, in which we are experience deficient, despite its mounting credibility and innovative ventures.[3]

This new era of metabolic vascular nutrigenomics harnesses our inherent ability to modulate the interface between specialized gene receptors and bioavailable nutrients in what's recently labelled as the nutrient-gene interaction. By mimicking a natural process through the conveyance of highly absorbable receptor specific nutrients, it is feasible to accelerate cell repair and optimize mitochondrial function and thereby achieve the ultimate cardiovascular cure.

A new era of regenerative medicine is about to strike on a global scale and nutrigenomic substances that modulate the activity of SIRT enzymes and have the power to master regulators of survival during stress and extend life span will strike our shelves in next to no time.[4,5]

Up-regulation of SIRT enzymes regulates glucose utilization, augments insulin sensitivity and boosts exercise tolerance. These imperative physiological adjustments are a frank consequence of amplified mitochondrial biogenesis. Resveratrol epitomize the first in a novel class of SIRT activators that has been established as a safe well-tolerated vascular nutrigenomic in humans.[6]

No doubt, future generations accustomed to living past 100 years will gaze back at our present methodology for vascular intervention as a primitive relic of a bygone era. On the other hand, those who are currently eager to pop a pill and live to 130 years may have been born about half a century ahead of time.

Two-thirds of American patients are in quest for alternative methods for managing their diseases. What's more, 50% do not dispense their prescription for fear of concealed side effects. On the other hand, emerging data demonstrate that the number of patients with congestive heart failure has quadrupled over the last decade and there is mounting evidence which links this exponential rise to depleting Coenzyme Q10 levels.[7-9] Coenzyme Q10, whose discovery earned its finder a Nobel Prize in 1978,[10] is a crucial factor in the production of ATP, which is required for Myocardium contractility. Coenzyme Q10 is a lipophilic molecule and this fat solubility is extremely important considering heart muscle acquires 65% of its energy from cholesterol.

More recently, the 2009 Nobel Prize in Medicine was awarded for the discovery of how telomere shortening is correlated with the aging process, whereby shorter telomeres are associated with shorter lives.[11] Specifically, individuals with shorter telomeres have nearly triple the cardiovascular mortality rate of people with longer telomeres.[12,13] Furthermore, adults above the age of 60 with shorter telomeres were eight times more likely to die from infectious disease.[14] Studies had demonstrated that lifespan could be increased five years by increasing the length of telomeres in people with shorter ones and that long-term endurance exercise training has proven protective effects on the arterial wall and immune system by activating telomerase and thereby reducing telomere shortening.[15,16]

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In addition, specific amino acids have been proven to play a vital role in cardiovascular anti-aging and regeneration. L-Arginine, which is a precursor of nitric oxide, has been shown to ameliorate blood vessel vasodilatation and augment myocardium and brain perfusion.[17,18] It had established promise in the management of cardiovascular atherosclerotic disorders by reducing blood pressure, lowering LDL cholesterol and reversing plaque maturity.[19] L Arginine is being labelled as the most procured amino acid for any cardiovascular antiaging program.[20]

Major studies of" cardiovascular free"centenarians delineated that low sugar and low insulin are consistent finding in such individuals.[21-23] The level of insulin sensitivity of the cell is one of the most crucial markers of lifespan.[24, 25] Insulin is a catabolic inflammatory hormone in the body and a pro-aging reversible factor. As we age, our insulin level increases. Those who can decelerate the rapidity of this process are prompting their cardiovascular anti-aging.

Metabolic or Insulin resistance Syndrome affects over 60 million Americans and one in four adults over the age of 35.[26-28] Those who are in the sub-clinical phase "age 35-45" and clinical phase of aging "age 45 and above" have a one in three chance of getting this syndrome and not knowing it. Metabolic Syndrome may be the cause of up to fifty percent of all cardiovascular morbidities. It is an epidemic of massive proportion. Fortunately, it can be reversed with a diet high in unsaturated fat, low in protein, and moderate in carbohydrate.[29-32] Exercise, weight management, and metabolic vascular nutrigenomics, help to normalize blood glucose level and increase insulin sensitivity.[33-36]

Moreover, the contemporary management of type 2 diabetics has been subject to scrutiny and potentially raises some ethical dilemmas. Although the patient might appear to have a need for insulin therapy, the introduction of insulin in the context of severe insulin resistance may lead to hyperinsulinemia and consequently accelerate their metabolic vascular derangement, resulting in high morbidity and mortality![37] Conversely, Metformin is a pro antiaging agent that can oppress 80% of all type 2 DM.[38, 39]

Right now diabetics can be cured through nutrigenomics and with close attention to metabolic vascular intermediaries patients can be weaned off their medication. In addition, in the context of the deranged metabolic milieu that exists for diabetic patients, they fair poorly with beta blockers,[40,41] diuretics[42,43] and statins[44] and may require doubling the dose of potent antiplatelets to achieve a therapeutic effect.[45, 46]

Beta blockers,[40] Flouroquinolones,[48] Phenothiazines[49] and Thiazide diuretics[42] stall insulin secretion through diverse modalities but Aspirin,[50] MAO inhibitors[51,52] and methyltestosterone[53] boost the action of Insulin and can lower blood glucose levels to a precarious level. Overseeing such patient's commands particularized expertise of drug interaction and proficient confidence in adjusting patient medications as some of these patients are able to go off insulin utterly by altering concomitant medications that have an adversative upshot on insulin metabolism .

The ARIC study verified that patients indulged with Beta blockers have a 28% higher risk of developing type 2 DM.[54] This was further scrutinized in the CAPPP trial[55] and LIFE[56] study for which both established that Beta blockers have a 25% chance of developing Type 2 DM in non diabetic patients. These effects are arbitrated through impaired endothelium-dependent insulin mediated vasodilatation. Furthermore, unimpeded alpha-one receptor activation instigates vasoconstriction and diminishes blood flow to the muscles resulting in attenuation of insulin-stimulated glucose uptake in the periphery creating a state of insulin resistance.

The US Veterans Affair Healthcare System study on 15 million veterans in 10 hospitals in southern USA concluded that statins affect fasting and postprandial glucose level by inducing a state of hyperglycemia in diabetic as well as non diabetic patients.[57] This relationship between statin use and rise in glucose level

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is independent of age and use of aspirin, beta blockers and angiotensin-converting enzyme inhibitors. However, a sub-analysis of the JUPITER study showed that statin therapy can induce full blown type 2 diabetes in women.[58]

This also was astonishingly shown in the substudy of PROVE-IT TIMI 22, in which there was a significant increased risk of developing HBA1c>6% in both diabetics and non diabetics.[59] Moreover statin can induce a state of semi insulin resistance as proven by Huptas et al.[60]

Statins manipulate glucose metabolism as a consequence of its inhibitory effects on adipocytes by means of inducing resistance through reduction in insulin-stimulated glucose uptake with a strong impact on glycemic control in non obese patients.[61] The poise of use of statin and clear upshot is dogged by the patient metabolic condition and whether statin could amend or impair insulin resistance and ultimately Type 2 DM.

We must gaze at sugar as a drug and dwell as far away as possible from its consumption. It is more treacherous than smoking and hypercholesterolemia combined. Cardiovascular anti-aging diet must converge on three core pillars: a diminution of calories by 30 percent, a growth in green leafy vegetables intake by 60 percent and a cutback on refined sugar intake by 90 percent.[62]

Insulin resistance and hyperglycemia are culprits in the development of vascular diseases in two thirds of the population. However, this can be reversed through Cardiovascular Anti-Aging programmes.[63-66]

Functional metabolic vascular medicine with nutrigenomics by divulging a capsule, created from L-Arginine, Coenzyme Q10, Quercetin, Resveratrol, D-Ribose and Acetyl L Carnitine would permit us to indulgence a diverse class of medical disorders in a physiological manner. Until such a once-a-day top up is feasible, we must promote cardiovascular anti-aging programs, which consist of achievable lifestyle adjustments with caloric restriction, 12 hours fasting from 6 pm to 6 am, 30 minutes daily endurance exercise and the aforementioned nutrigenomics.

These are methods and techniques that we must master in our present and future practice. The Cardiovascular community must expand on its history of revolution and redeem ourselves from the effortless fashion of prescription cardiovascular drugs or ingenuous vascular intervention.

Notes

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