Risk Probability of Having Chronic Kidney Disease over the Past Ten Years

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Abstract

The author, who has type 2 diabetes (T2D) for over 25 years, is a research scientist on chronic diseases. He has endured many complications from T2D involving kidney, bladder, foot ulcer, retinopathy, hyperthyroidism, and five cardiac episodes. In this paper, he focuses on investigating the risk probability (Risk) of having chronic kidney disease (CKD).This investigation does not focus on kidney data (ACR) alone. His main purpose is to study the relationship between kidney complications and chronic diseases, especially T2D and CKD, from a larger pool of

such as food, exercise, weather temperature, sleep, stress, and more. Among those many influential factors, the two most prominent are carbs/sugar intake (39%) and post-meal exercise (41%). Not only does exercise reduce inflammation in the organs but also highly effective in decreasing glucose level quickly; therefore, the "post-meal" exercise impacts PPG more obviously. Although some human psychological behaviors, such as overeating and being sedentary, are quite common for most people, diet control is indeed far more complicated than exercising in terms of scope of knowledge, variety of choices, and degree of difficulty.

Once diet and exercise are in place, most likely, glucose and HbA1C will be well controlled. Having glucose control combined with the management of both blood pressure (reduce salt consumption, avoid stress, exercise) and lipid (avoid fat, reduce cholesterol consumption, exercise), the blood system (artery and micro-vessels) will then be in a healthy state. This will definitely reduce the risks of having vascular disease such as CVD and stroke along with micro-vessels and nervous system problems, such as CKD or renal failure, bladder infection, foot ulcer, diabetic retinopathy, and erectile dysfunction, and so forth.

CKD Risk Assessment Model

Instead of using traditional biology and chemistry, the author utilized mathematics, physics, engineering modeling, and computer science to conduct his research.

In 2018, he developed a sophisticated and complex mathematical model to calculate his risk probability of having CKD. He has spent 30,000 hours to research, collect and process ~2 million data during the period of 2010-2020.

At first, he built a baseline model, including genetic (steady state and unchangeable conditions), semi-permanent factors (weight, waistline), and bad habits, such as hard to change conditions, such as smoking, alcohol drinking, illicit drugs. Next, he developed a risk probability calculation model of estimating the leakage of micro-blood vessels due to different medical conditions mainly diabetes and hypertension.

Finally, he applied his collected ~100,000 data of medical conditions regarding chronic diseases and ~1 million data of lifestyle details, from the past ten years, to calculate their combined contribution to kidney complications, including glucose, blood pressure, kidney, glomeruli, bladder, urinary tract, etc [1].

For the purpose of this analysis, he made his last but most important step of the calculation. He used lab-tested data of albumin, creatinine, and albumin-creatinine ratio (ACR) from the past ten years as the yardstick of comparison against his input data.

It should be noted here that the risk probability percentages are expressed on a "relative" scale, not on an "absolute" scale.

Results

Albuminuria categories in CKD, from the Am}ŏ