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Risk Probability of Having A Renal Complication using Annual Segmented Data of Glucose and Metabolism Index (GH Method:Math-Physical Medicine)

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Introduction

In this paper, the author describes the quantitative relationship between his risk probability of having renal complications and his annual segmented data of both average daily glucose and daily metabolism index (MI) by using GH-Method: math-physical medicine.

Method

In 2014, the author applied topology concept, finite-element engineering technique, and nonlinear algebra operations to develop a mathematical metabolism model, which contains ten categories including four output categories (weight, glucose, BP, other lab-tested data including lipid & ACR) and six input categories (food, water drinking, exercise, sleep, stress, routine life patterns and safety measures). These 10 metabolism categories include approximately 500 detailed elements. He further defined a new parameter referred to as the metabolism index (MI) that has a combined score of the above 10 metabolism categories with 500 elements. Since 2012, he has collected and stored ~2 million data of his own body health conditions and personal lifestyle details.

He then developed a set of algorithms which include a patient's baseline data (e.g. age, race, gender, family genetic history, medical history, and bad habits) and conducted the following three calculations:

(1) Medical conditions - individual M1 through M4: i.e. obesity, diabetes, hypertension, hyperlipidemia and others

(2) Lifestyle details - individual M5 through M10

(3) MI scores - a combined score of M1 through M10

With this mathematical risk assessment model, he can obtain three separate risk probability percentages to offer a range of the risk prediction of having renal complications resulting from metabolic disorders, unhealthy lifestyles, and their combined impact on the human body.

It should be noted that through applications of his academically learned structure mechanics and fluid dynamics along with the newly acquired biomedical knowledge, he has accentuated the two different situations of CVD/stroke due to blockage or rupture of arteries impacted by glucose, BP, & lipids and renal complications caused by damage on micro-vessels or leakage caused by glucose and BP.

Through his developed predicted weight and glucose (FPG, PPG, and A1C) models, he has successfully reduced his glucose level from 280 mg/dL (A1C 10%) during 2010 to 116 mg/dL (A1C 6.4%) during his "no medication" period of 2015 -2019. In addition, his ACR has also dropped from 116 mg/g in 2010 down to 8 mg/g in 2018.

During a particular period of 2018 through 2019, he has attended more than 60 medical conferences located in 50 international cities and presented more than 100 presentations. These unusual busy traveling schedules and heavy workload have brought tremendous amount of stress and strain on his body and his health conditions. As a result, his overall MI scores have been slightly increased during these two years, although his annual average glucoses still decreased slightly due to his through knowledge and acute attention on his diet and exercise while traveling.

Results

Figure 1 shows his daily data of both glucose and MI from 2014 through 2019. The calculated annual glucose and MI values are displayed inside this figure.

Figure 2 depicts his risk probability of having renal complications from 2010 through 2019. The risk has been reduced from 69% in 2000 to 35% in 2017 and then continuously decreased to 33% in 2019.

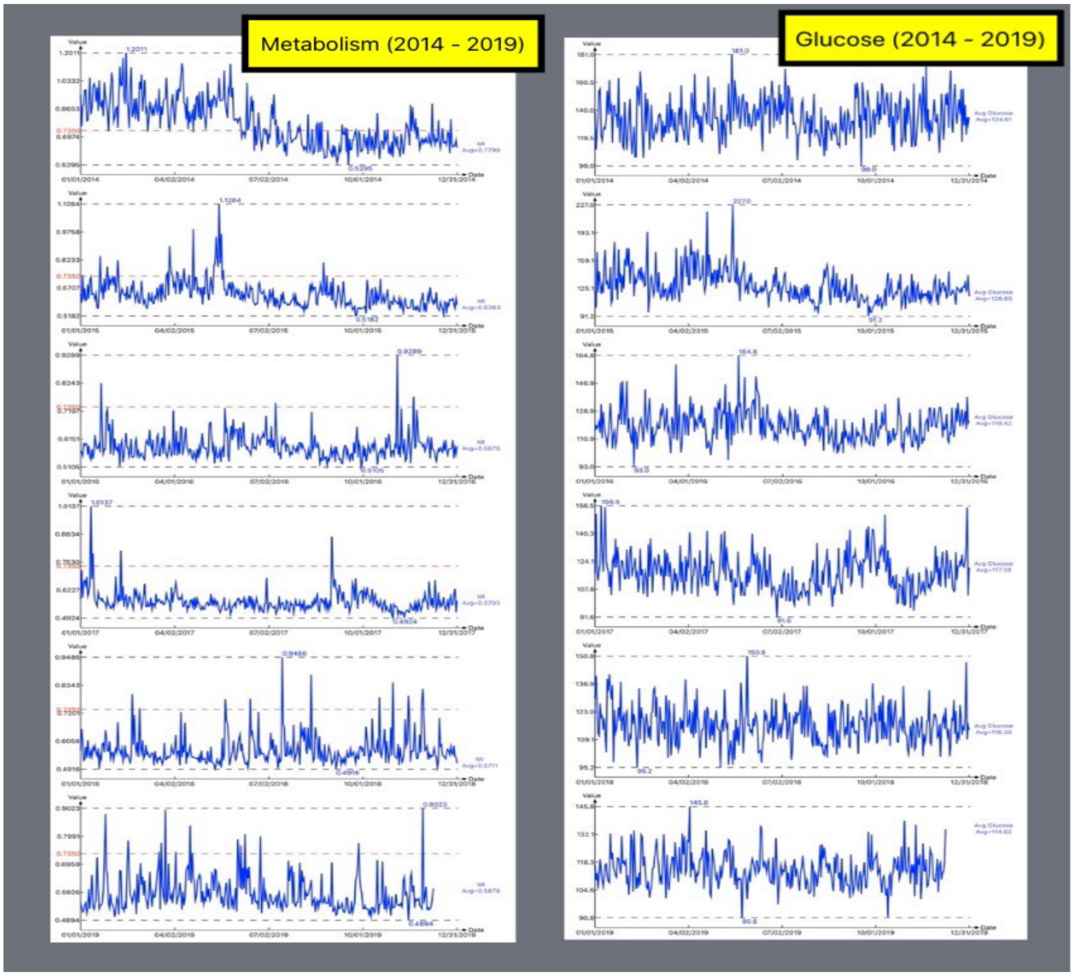


Figure 1. *Annualized metabolism index (MI) and glucose data*

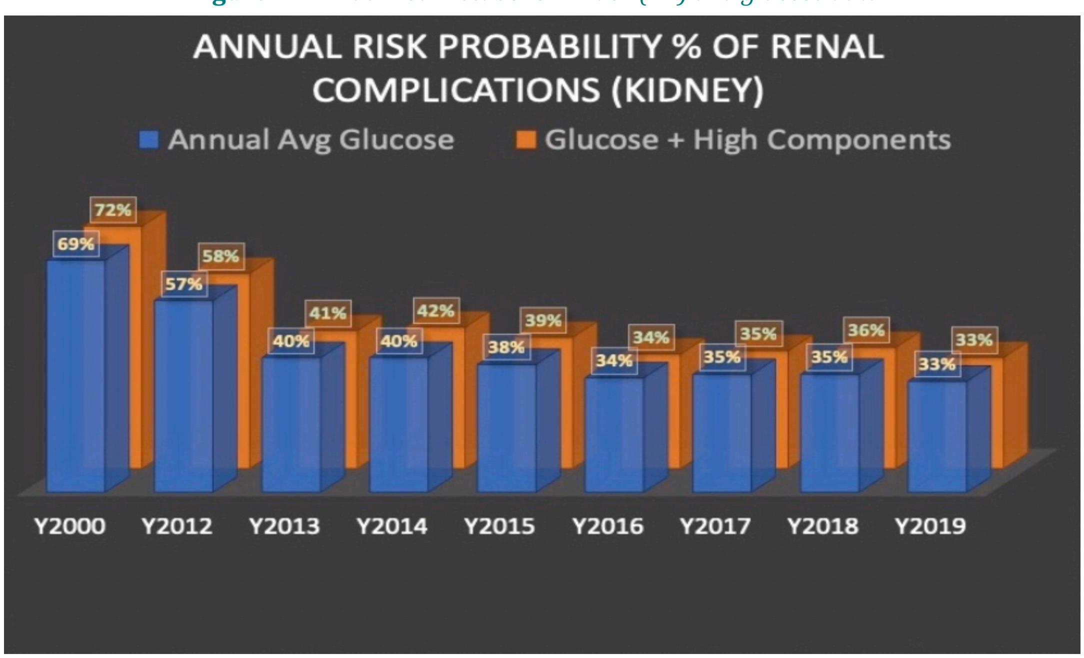
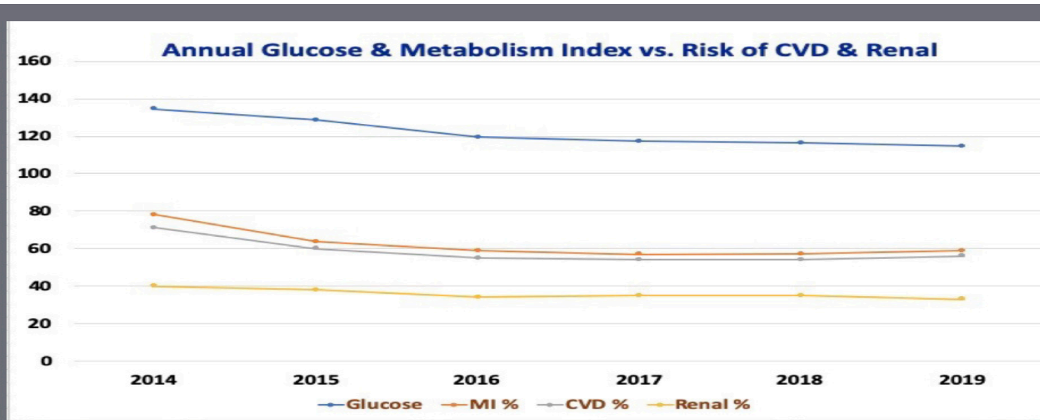


Figure 2. *Annualized risk probability of having renal complications*

Figure 3 illustrates three curves and data table of annualized glucose, MI, and Renal risk % together. It clearly shows that both glucose and renal risk % are continuously dropping from 2014 through 2019 except MI values have slightly increased during 2018 and 2019 due to his traveling life.



	Glucose	MI %	CVD %	Renal %
2014	134.61	77.99	71	40
2015	128.65	63.63	60	38
2016	119.42	58.78	55	34
2017	117.38	57.03	54	35
2018	116.36	57.11	54	35
2019	114.62	58.78	56	33

Figure 3. *Annualized curve and data of Glucose, MI, CVD %, Renal %*

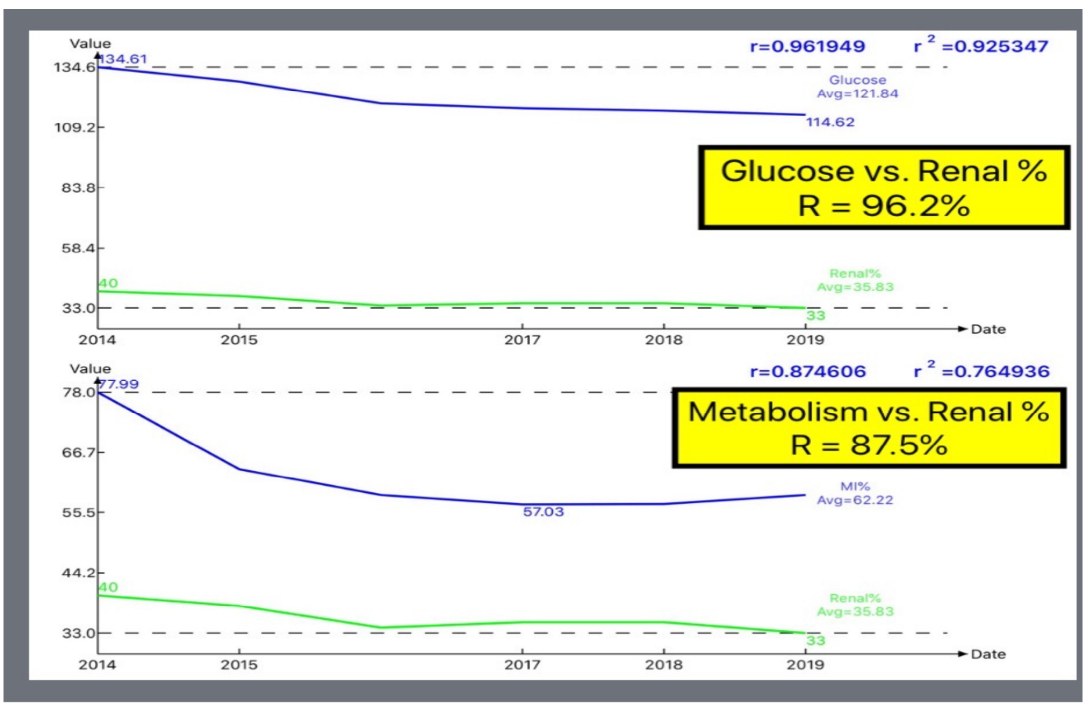


Figure 4: Two Renal Correlation Coefficients (R)

Figure 4 displays the following two correlation coefficients (R)

between: (1) Glucose vs. Renal risk = 96.2%

(2) MI vs. Renal risk = 87.5%

These prove that risk probability of having renal complications depends more on glucose condition (diabetes), rather than the overall metabolism conditions despite glucose as being one of the vital input variables of the metabolism index.

Figure 5 presents a combined diagram of glucose, MI, and renal complications risk probability %.

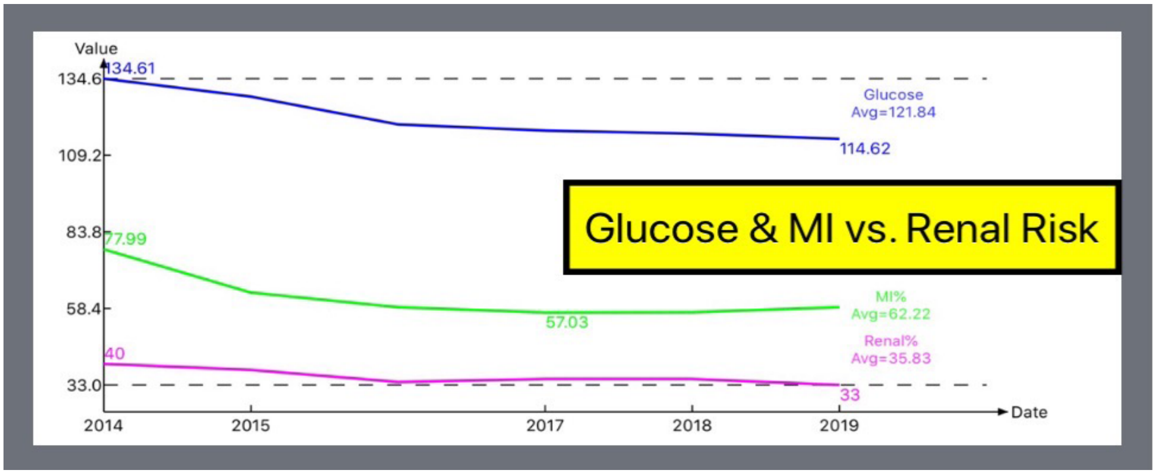


Figure 5. *Three Curves of Glucose, and MI, Renal %*

Conclusions

This paper has proven the strong influence of glucose on renal complications risk probability % by using the annually segmented glucose (and MI) data.

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