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Relationship between Metabolism and Risk of Cardiovascular Disease and Stroke, Risk of Chronic Kidney Disease, and Probability of Pancreatic Beta Cells Self-Recovery using GH-Method: Math-Physical Medicine

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Editor note on

The author uses GH-Method: math-physical medicine (MPM) approach to investigate his risk probability on metabolic disorder induced cardiovascular disease (CVD), stroke, or chronic kidney disease (CKD), as well as probability of pancreatic beta cells self-recovery. He addresses the damages caused by metabolic disorders affecting arteries and micro-vessels in terms of blockage, rupture, or leakage along with the probability assessment of pancreatic beta cells self-recovery. Furthermore, he uses mathematical correlations to distinguish the weighted impact by metabolism on heart, brain, kidney, and pancreas. 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 basic output categories such as weight, glucose, BP, and other lab-tested data (lipid, ACR, and TSH), and six basic input categories such as food, water drinking, exercise, sleep, stress, routine life patterns and safety measures, with approximately 500 detailed elements. For self-recovery of pancreatic beta cells, he examined annual change rate of FPG, PPG, and HbA1C. However, there is a data reliability issue associated with existing medical testing and measurement community, including finger-piercing glucose devices, continuous glucose monitoring sensor devices, and lab-tested HbA1C devices and process. Regarding these four prominent influential biomarkers, i.e. MI %, CVD risk %, CKD risk %, and Beta cells %, he further calculated three pairs of correlation coefficients using time-series method. Due to the small data volume in this study using "annualized" averaged data, he cannot apply the powerful spatial analysis method. Spatial analysis method can provide an accurate and clear picture of data relationship pattern and moving trend; however, it also requires a bigger size of collected data than time-series method in order to conduct its analysis.

Conclusion

These annualized big data analytics using four different sophisticated mathematical models for MI, CVD, CKD, and Pancreatic beta cells have demonstrated the close relationships between metabolism and two major chronic diseases induced complications, CVD/Stroke and CKD, as well as the beta cells self-recovery rate. By using the GH-Method: MPM math-physical medicine approach, it can certainly attain similar conclusions without lengthy and expensive biochemical experiments performed in a laboratory.

Biography

Gerald C. Hsu received an honorary PhD in mathematics and majored in engineering at MIT. He attended different universities over 17 years and studied seven academic disciplines. Furthermore, he self-studied and research three disciplines, internal medicine, food nutrition, and psychology. He has spent ~30,000 hours in endocrinology research, especially diabetes. First, he studied six metabolic diseases and food nutrition during 2010 to 2013, then conducted his own diabetes research during 2014 to 2018. His approach is "quantitative and precision medicine" based on mathematics, physics, optical and electronics physics, engineering modelling, wave theory, energy theory, signal processing, computer science, big data analytics, statistics, machine learning, and artificial intelligence. His main focus is on preventive medicine using prediction tools. He believes that the better the prediction, the more control you have. Thus far, he has written, published, and presented more than 250 medical papers, including some psychology research papers.

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