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Relationship between glucose and blood pressure

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The author has been subjected to three chronic diseases since 1997. He has maintained a disciplined lifestyle program since 2012 and collected 1.5 M health and lifestyle data. This paper discusses specifically the relationship between glucose and blood pressure. He has defined two simple equations: (1) Daily average glucose mg/dL = $(1 \text{ FPG} + 3 \text{ PPG})/4$ and (2) Daily average blood pressure (M3: Metabolism Index 3) = $1.0 + ((\text{SBP} - 120)/120 + (\text{DBP} - 80)/80)/2$. A 90-days moving average for both glucose and blood pressure can identify the correlation between two signals. A spatial analysis (without time) is used to figure out a “quasi-linear” equation between them. In this paper 13,320 data from 1,480 days (2/8/2014-2/27/2018) were used for analysis. He had many SBP and DBP spikes in 2014; however, after 2015, his BP (M3) has been stabilized into a healthy state. A high correlation of 79% existed between SBP and DBP with an average of 41 mmHG gap in between. The time series analysis of 90 days moving average of glucose vs. BP (M3) shows a strong correlation of 66%. This correlation is further validated with a spatial analysis which shows 78% and 99% of the total collected data covered by a $\pm 10\%$ and $\pm 20\%$ variance band of BP (M3) respectively. This relationship band stretched from point A (90, 0.8) to point B (190, 1.06) on a map with coordinates of $x = \text{glucose}$ and $y = \text{BP, M3}$. Using big data analytics on an overweight patient, results show a strong relationship existing between glucose and blood pressure.

Biography

Gerald C Hsu has received an honorable PhD in Mathematics and majored in Engineering at MIT. He has attended different universities over 17 years and studied 7 academic disciplines. His approach is “Math-Physics and Quantitative Medicine” based on mathematics, physics, engineering modeling, signal processing, computer science, big data analytics, statistics and machine learning. He focuses on preventive medicine using prediction tools.

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