Using GH-Method: Math-Physical Medicine to Investigate the Role of HbA1C in the Triangular Relationship with Weight and Blood Pressure

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INTRODUCTION

The author uses math-physical medicine approach to investigate three sets of correlation between:

(1) Weight vs. Glucose/HbA1C - daily average glucose, including both fasting plasma glucose (FPG) and postprandial plasma glucose (PPG).

(2) Weight vs. blood pressure (BP).

(3) Glucose/HbA1C vs. BP

METHOD

The selected time frame is from 4/1/2014 to 12/31/2018 (1,735 days) with big data of ~18,000 metabolic conditions such as Weight, Glucose/A1C, and BP. This paper utilized both time-series and spatial analysis to investigate those triangular relationships.

RESULTS

The time-series analysis results show strong correlations among these three pairs of curves.

Weight vs. Glucose / A1C: 78% / 78%

Weight vs. BP: 62%

Glucose / A1C vs. BP: 84% / 85% (1% difference is due to numerical tolerance).

In spatial analysis, all of the three sets in the diagram demonstrate various degree of strong correlation between any two variables. In addition, the three diagrams have 94% to 99% of data covered by +/- 20% variance band. The reason for the lower slopes between weight vs. glucose is due to the fact that FPG has higher correlation with weight, whereas PPG does not. The most interesting observation is the exceedingly high correlation or higher slope existing between glucose vs. BP.

The major difference between influences from Glucose and A1C is shown by the gap between two adjacent data clouds. This is due to the author's glucose and A1C data that suddenly dropped significantly duringtheperiod, the second half of 2014 through the first half of 2015, after following his developed mathematical metabolism model and some practical ways to control his diabetes. When he switched the X-axis and Y-axis in the spatial analysis graphic diagrams, the gap still exists in each diagram although the general orientations of data clouds are somewhat different.
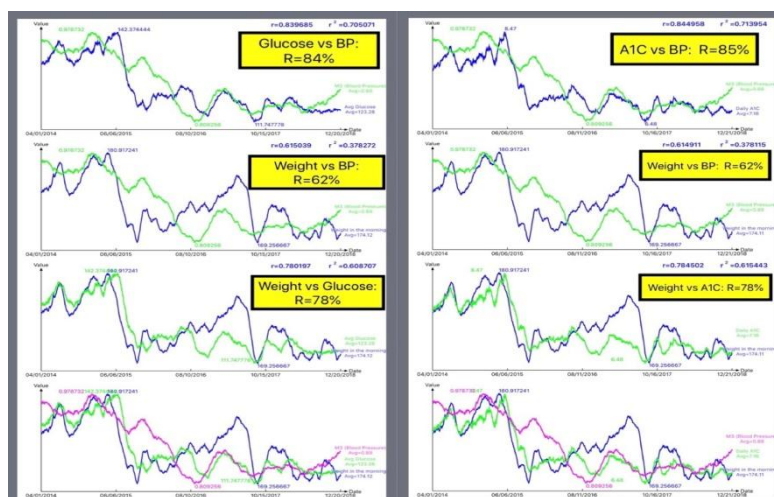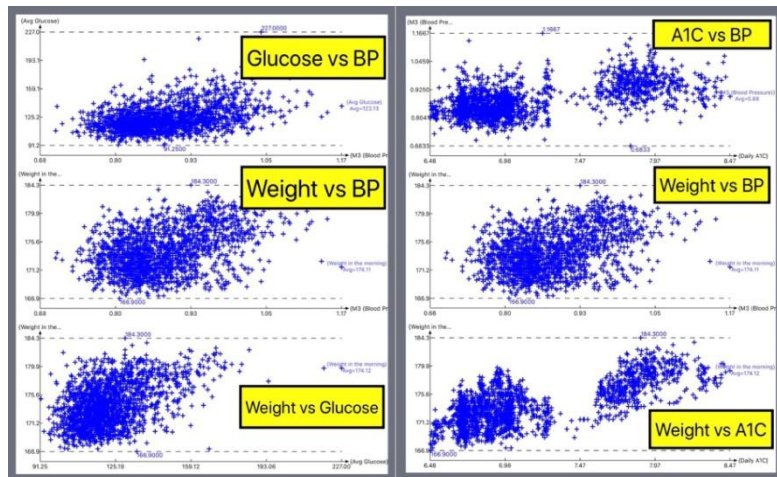

Figure 1: *Time-series comparison between Glucose vs. Weight/BP and A1C vs. Weight/BP*

Figure 2: *Spatial analysis comparison between Glucose vs. Weight/BP and A1C vs. Weight/BP*
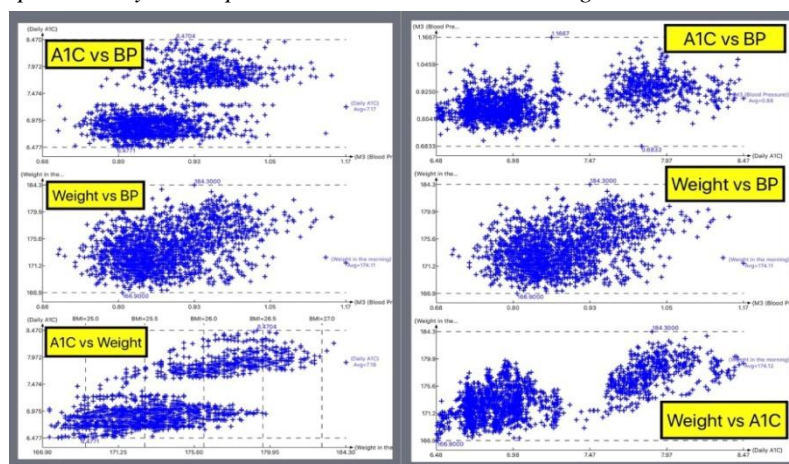

Figure 3: *Observation of A1C variance via switching X-axis and Y-axis*

CONCLUSION

By using the GH-Method: math-physical medicine approach, strong triangular relationships among weight, glucose/A1C and blood pressure are obvious. This confirms the many qualitative descriptions that existed in the medical community.

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