

Using GH-Method: Math-Physical Medicine to Investigate Different Contribution Margins of Fasting Plasma Glucose vs. Postprandial Plasma Glucose on HbA1C

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Introduction

This paper displays results of the contribution margin calculation of fasting plasma glucose (FPG) vs. postprandial plasma glucose (PPG) on HbA1C. The dataset is provided by the author, who uses his own type 2 diabetes metabolic conditions control, as a case study via the “math-physical medicine” approach of a non-traditional methodology in medical research.

Math-physical medicine (MPM) starts with the observation of the human body’s physical phenomena (not biological or chemical characteristics), collecting elements of the disease related data (preferring big data), utilizing applicable engineering modeling techniques, developing appropriate mathematical equations (not just statistical analysis), and finally predicting the direction of the development and control mechanism of the disease.

Methods

The author has collected two sets of glucose data. The first set consists of finger-piercing (Figure 1: Finger) for a period of 1,484 days (5/1/2015 - 5/24/2019) with 5,936 data (four times a day, 1 FPG, 3 PPG). The second set involves the continuous monitoring sensor (Figure 2: Sensor) for a period of 385 days (5/5/2018 - 5/24/2019) with 28,105 data (73 times a day).

Based on wave theory and energy theory of physics, he conducted detailed glucose analyses (Figures 3 & 4) using both time-series (Time) and frequency-domain (Frequency) to calculate three sets of results:

1. Average glucose in Time
2. Energy based on square of glucose
3. Energy from Y-axis amplitude of Frequency

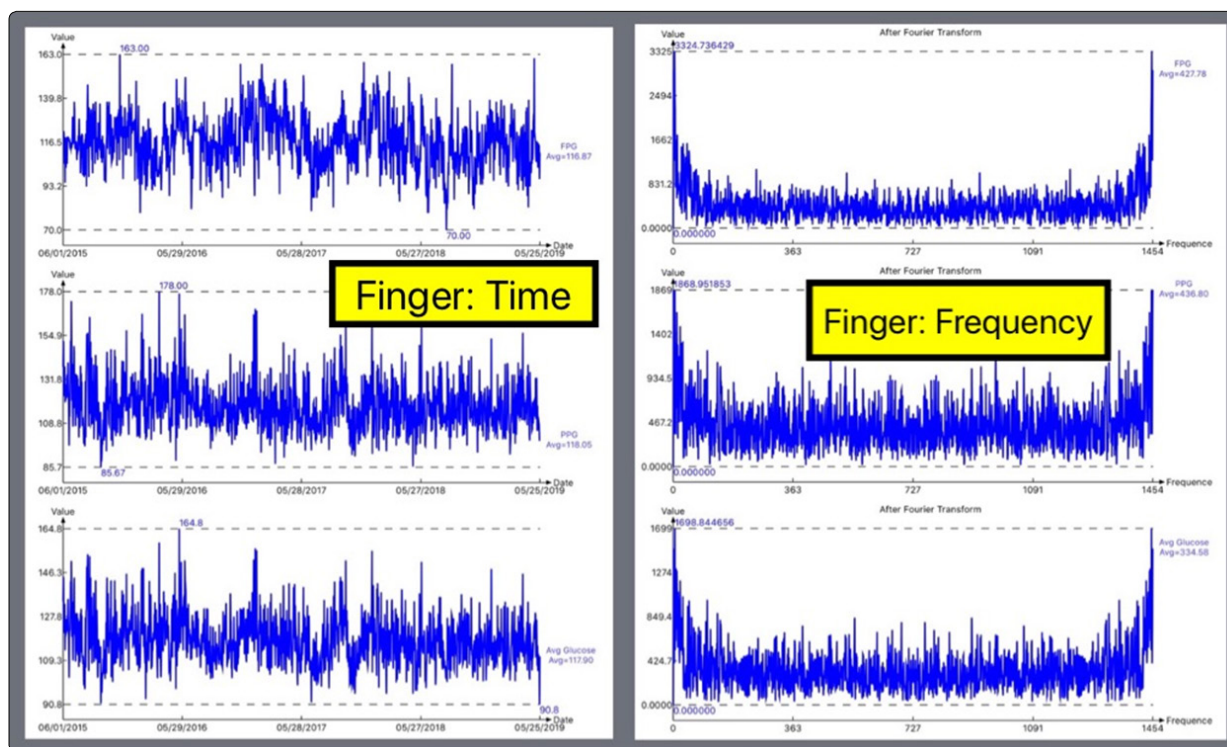


Figure 1: Finger (FPG, PPG, and Daily Glucose)

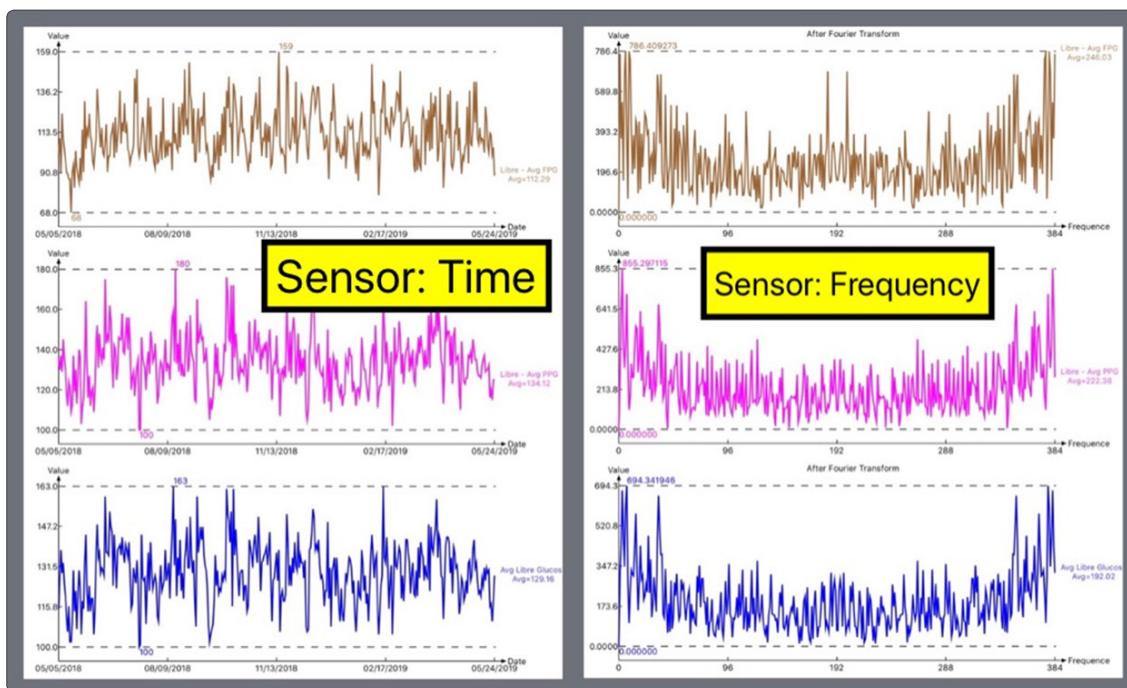


Figure 2: Sensor (FPG, PPG, and Daily Glucose)

Finger Method:	Value	%	Sensor Method:	Value	%
FPG (Energy: f)	427.8	24.61%	FPG (Energy: f)	246.0	26.94%
PPG (Energy :f)	436.8	75.39%	PPG (Energy :f)	222.4	73.06%
Total (Energy: f)	334.6	100.00%	Total (Energy: f)	192.0	100.00%
FPG (Glucose: t)	116.9	24.81%	FPG (Glucose: t)	112.3	21.82%
PPG (Glucose: t)	118.1	75.19%	PPG (Glucose: t)	134.1	78.18%
Total (Glucose: t)	117.9	100.00%	Total (Glucose: t)	129.2	100.00%
FPG (Square)	13659	24.63%	FPG (Square)	12609	18.94%
PPG (Square)	13936	75.37%	PPG (Square)	17988	81.06%
Total (Square)	13900	100.00%	Total (Square)	16682	100.00%

Figure 3: Contribution margin calculations based on Glucose and two Energy methods (Finger vs. Sensor)

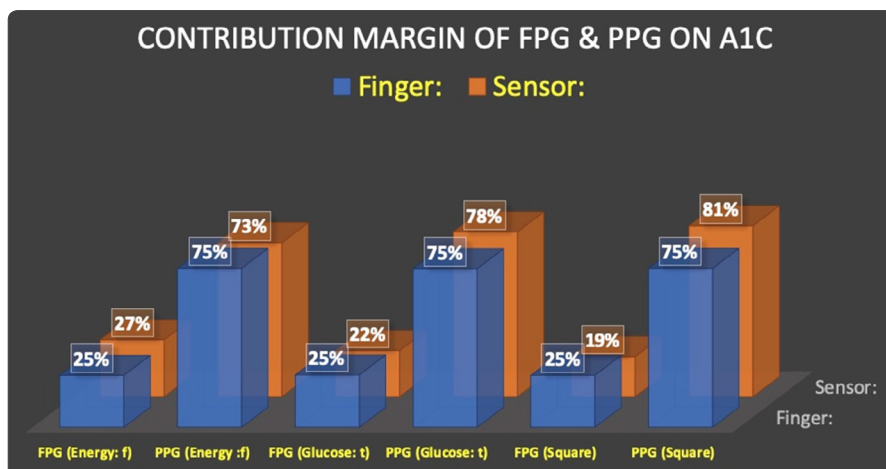


Figure 4: Contribution margin graphics based on Glucose and two Energy methods (Finger vs. Sensor)

Results

As depicted in Figure 4, the summarized results are as follows:
FPG: Finger 25%, Sensor 19%-27%
PPG: Finger 75%, Sensor 73%-81%

The Finger method provides more precise percentages due to the limited collection of four data per day (25% vs. 75%), while the Sensor method provides wider ranges of percentages due to a bigger collection of 73 data per day.

For the past five years, the author has frequently performed “dynamic re-adjusting via trial-and-error” analysis of glucose margins. From those repetitive patterns, he has already observed the contribution margin of FPG at about 20-30%, whereas the input for PPG at about 70-80%. This paper’s sophisticated physical and statistical analyses have further reconfirmed his earlier findings.

Conclusions

This analysis based on the GH-method: math-physical medicine can provide an accurate split of contribution margin between FPG and PPG. This particular knowledge on glucose is extremely practical and useful to help T2D patients on controlling their HbA1C [1-5].

References

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