

The GH-Method

Self-Recovery of Pancreatic Beta Cell's Insulin Secretion Based on Annualized Fasting Plasma Glucose, Baseline Postprandial Plasma Glucose, and Baseline Daily Glucose Data Using GH-Method: Math-Physical Medicine (No. 297)

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Abstract

This article provides additional proof of the author's pancreatic beta cell's self-recovery of insulin secretion via his annualized data of baseline postprandial plasma glucose (PPG), fasting plasma glucose (FPG), and baseline daily glucose over a period of 5.55 years from 1/1/2014 to 7/19/2020. These two glucose, baseline PPG and measured FPG, do not have any influences from food and exercise which are the primary two factors of glucose formation and fluctuation. Over this period, his baseline daily glucose without the two major influences of food and exercise was reduced by an amount of 13.2% from 120 mg/dL in 2014 to 106 mg/dL in 2020. His baseline daily glucose has decreased by 2.4% per year. This is equivalent to his pancreatic beta cells being repaired at an annual rate of 2.4%. The finding is comparable with his previous results in

References 1 through 5, where the beta cell's self-recovery annual rate was 2.3% to 3.2%. He has utilized seven different ways and big datasets to obtain similar findings. The author wrote six papers discussing his pancreatic beta cell's self-recovery of insulin secretion. He has used several different "cutting angles" or analysis approaches to delve deeper into this biomedical subject and achieved consistent results within the range of 2.3% to 3.2% of annual self-recovery. In his opinion, type 2 diabetes (T2D) is no longer a non-reversible or non-curable disease. Diabetes is not only "controllable" but it is also self-repairable, even though at a slower rate. He has repaired his damaged pancreas about 13% to 19% over the past 6 to 8 years. The author would like to share the research findings with his colleagues and wants to encourage other diabetes patients like himself.

Keywords: Type 2 diabetes; Pancreatic beta cells; Fasting plasma glucose; Postprandial plasma glucose; Daily glucose

Abbreviations: T2D: type 2 diabetes; FPG: fasting plasma glucose; PPG: postprandial plasma glucose

1. INTRODUCTION

This article provides additional proof of the author's pancreatic beta cell's self-recovery of insulin secretion via his annualized data of baseline postprandial plasma glucose (PPG), fasting plasma glucose (FPG), and baseline daily glucose over a period of 5.55 years from 1/1/2014 to 7/19/2020. These two glucose, baseline PPG and measured FPG, do not have any influences from food and exercise which are the primary two factors of glucose formation and fluctuation.

2. METHODS

In 1995, the author was diagnosed with severe T2D. His daily average glucose reached 280 mg/dL with a peak glucose of 398 mg/dL and his HbA1C was at 10% in 2010. Since 2005, he has suffered many kinds of diabetes complications, including five cardiac episodes, without having a stroke, foot ulcer, renal complications, bladder infection, diabetic retinopathy, and hyperthyroidism.

As of 7/20/2020, his daily average glucose is approximately 110 mg/dL, and his HbA1C is at 6.4%. It should be mentioned that he started to reduce the dosage of his three different diabetes medications (maximum dosages) in early 2013 and finally stop taking them on 12/8/2015. In other words, his glucose record from 2016 until now is medication-free.

Beginning on 1/1/2012, he started to collect his glucose values four times a day (1x FPG in the early morning and 3x PPG, two hours after the first bite of each meal). Since 1/1/2014, he started to collect his carbs/sugar amount in grams and post-meal walking steps. This is the reason the glucose data used in this study are from 1/1/2014 through 7/19/2020; however, his glucose values from 1/1/2014 to 12/8/2015 were still under the influence of diabetes medications, mainly Metformin.

The author has written 296 medical papers in the past 2.5 years. His earlier research results have shown that there are as many as 19 factors, which influence PPG and 5 factors for FPG. The major influential factors are medications, diet (carbs/sugar amount), and exercise (post-meal walking). Diet and

exercise do not impact FPG since it is measured first thing in the morning after 8 hours of fasting. The remaining secondary influential factor includes weather temperature, stress, sleep, reliability of glucose measurement devices, measurement time delay, illness, physical injury, and strong emotional disturbance. However, for the author himself, the above secondary factors have remained at approximately the same level or a constant degree, without any significant differences from year to year. Therefore, he can focus only on both diet and exercise.

Once he removed carbs/sugar and walking steps from the PPG formation equation, he could then obtain a "Baseline PPG" value. In his calculation, he applied what he found from his previous research results: each gram of carbs/sugar would increase by 2.2 mg/dL of PPG, and every thousand steps of post-meal walking would decrease by 5 mg/dL of PPG. In other words, he developed the following two simple formulas:

$$\text{PPG Adjustment} \\ = \text{carbs/sugar} * 2.2 - (\text{steps}/1000) * 5$$

$$\text{Baseline PPG} \\ = \text{measured PPG} - \text{PPG adjustment}$$

Furthermore, he used another simple formula to obtain his "Baseline Daily Glucose":

$$\text{Baseline Daily Glucose} \\ = \text{FPG} * 25\% + \text{baseline PPG} * 75\%$$

3. RESULTS

Figure 1 shows his measured PPG, PPG Adjustment, and Baseline PPG from 2014 to 2020. During the period of medication intervention from 2014 through 2015, both his measured PPG and Baseline PPG are around 10+ mg/dL higher than in the years following 2016. The turning points of his glucose fluctuation were in 2016 and 2017, while 2018, 2019, and 2020 were his low glucose period.

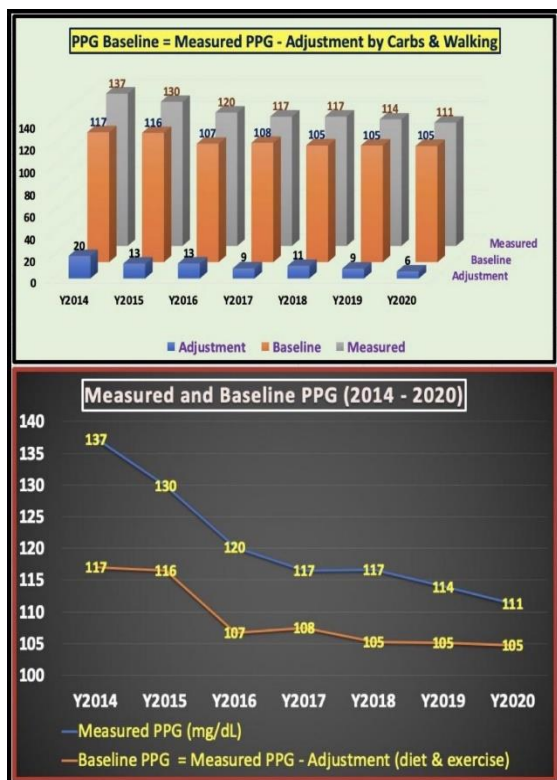


Figure 1: Measured PPG, PPG adjustment, and baseline PPG.

Examining his PPG adjustment due to carbs/sugar and post-meal walking, it is clear that they dropped from 20 mg/dL in 2014 to 13 mg/dL in 2015, then to 9 mg/dL in 2017, and finally to 6 mg/dL in 2020. This means that the PPG adjustment played a significant role in the early years, with diminishing results on its influences on PPG in future years. Nevertheless, his Measured PPG has decreased from 137 mg/dL in 2014 down to 111 mg/dL in 2020, and his Baseline PPG also dropped from 117 mg/dL in 2014 down to 105 mg/dL in 2020. If the PPG level reaches 105 mg/dL for the Baseline PPG or 111 mg/dL for the Measured PPG without any medication intervention, this indicates no longer having diabetes.

Figure 2 shows a 3-line chart of his Measured FPG, Baseline PPG, and Baseline Daily Glucose. The gray line, located in the middle, is most important because it represents the Baseline Daily Glucose. In 2014, it dropped from 120 mg/dL to 106 mg/dL in 2020. This set of data has excluded the first two strong influential factors of carbs/sugar and exercise. In addition, all of its secondary factors remain almost the same from 2014 through 2020. There is a third “hidden” influential factor to determine the final values of both Baseline PPG and Baseline Daily Glucose, which reflects “insulin”.

Therefore, using a statistical method of “decision making through elimination”, the influence of insulin can then be proven via the calculated total difference between 2014 and 2020 or the summation of year-to-year differences in Baseline Daily Glucose. The gap between 120 mg/dL in 2014 and 106 mg/dL in 2020 is 14 mg/dL or 13.2% over 5.5 years. On average, this represents a 2.4% annual difference of 2.4% of pancreatic beta cell's self-recovery rate per year.

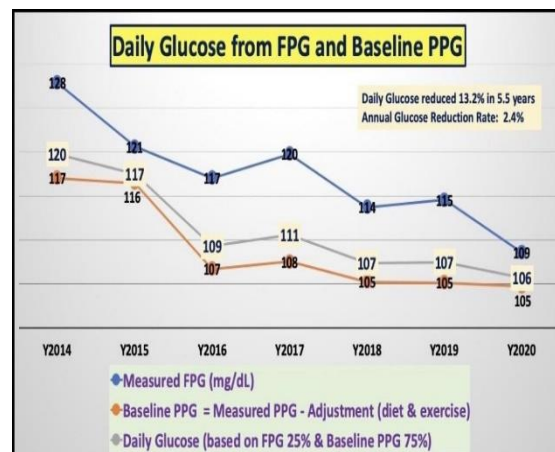


Figure 2: Measured FPG, baseline PPG, and baseline daily glucose.

Medication is a strong factor impacting glucose. However, the author's personal belief is to build up his inner core strength which is the best way to fight against chronic diseases, even though other patients find this difficult. Diabetes medications were only used in 2014 and 2015, which means that his Baseline Daily Glucose and Baseline PPG would be “higher” without those medications during that time. These “higher” glucose values would “enlarge the gap” between the periods of 2014-2015 and 2016-2020 which would further “increase” the beta cell's self-recovery rate. As a result, his 2.4% is a conservative result.

4. SUMMARY

The author wrote six papers discussing his pancreatic beta cell's self-recovery of insulin secretion. He has used several different “cutting angles” or analysis approaches to delve deeper into this biomedical subject and achieved consistent results within the 2.3% to 3.2% of annual self-recovery.

In his opinion, T2D is no longer a non-reversible or non-curable disease. Diabetes is not only “controllable” but it is also self-repairable, even though at a slower rate. He

has repaired his damaged pancreas about 13% to 19% over the past 6 to 8 years.

The author would like to share his research findings with his colleagues and wants to encourage other diabetes patients like himself.

5. REFERENCES

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