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Short Communication

Health Improvements using Metabolism Indexes of Four Different Time Periods (2012-2019)

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ABSTRACT

This study took place from November 2019-March 2020. Blood samples were collected from patients after informed consent by finger pricking. Stool samples were examined using normal saline and the Kato-Katz technique for the presence and intensity of IPs. Thick blood films were prepared, Giemsa-stained and examined under x100 to detect the presence of parasites and estimate GMPD. Hb values were determined using a haemoglobinometer. Data was analysed using SPSS version 23 and the significance level was set at P<0.05.

Keywords: Metabolism; Mathematics; Engineering

INTRODUCTION

In this research note, the author reviewed his past 8-years data from 2012 through 2019 by focusing on his performance on both diseases control and lifestyle management during four different time periods: 2014-2015, 2014-2018, 2015-2019, and 2018-2019.

METHODS

In 2014, by using advanced mathematics and engineering finite-element modeling techniques, the author developed a mathematical model of metabolic measurements, including 4-categories of diseases control (body outputs) and 6-categories of lifestyle management (body inputs) [1]. He started to collect his personal detailed data on 1/1/2012. Thus far, he has collected nearly 2 million data. He further assembled those 10-categories (with ~ 500 detailed elements) and combined them into two new terms: the metabolism index (MI), which is a combined daily score to show the body's health situation, and general health status unit (GHSU), which is the 90-days moving averaged number to show the trend. He also identified a "break-even line" at 0.735 (73.5%) to separate his metabolism conditions between healthy (below 0.735) and unhealthy (above 0.735). The main reasons he selected four specific time periods are listed below: Period A (2012-2014): He was unhealthy with the MI above 73.5% from 2012 to mid-2014. Period B (2014-2019): He became healthy near the end of 2014 and lasted through 2019 with the MI below 73.5%. Period C (2015-2019): He started to reduce his diabetes medications since 2013 and discontinued them toward the end of 2015. Period D (2018-2019): During these two years of a heavy travel schedule to attend 60+ international medical conferences, his daily life routine, including meals, sleep pattern, and stress level were affected to some degree with disruptions and damage to his health. Nevertheless, his behavior with direct control of his chronic diseases were maintained as before.

RESULTS

Figure demonstrates the author's overall metabolic conditions, including both MI and GHSU for the past 8-years (2012-2019), along with the detailed MI measurement standards of the above-mentioned four different periods (Figure 1). Both his MI and GHSU were >73.5% during 2012-2014 (unhealthy) and <73.5% during 2014-2019 (healthy). In 2014, his health greatly improved due to his knowledge and discipline. Figures depict the details of the following three categories of these four periods (Figures 2-5).

(1) Chronic disease conditions: M1 (obesity, weight), M2 (diabetes, glucose), M3 (hypertension, blood pressure), and M4 (hyperlipidemia, lipids);

(2) Lifestyle management details: M5 (exercise, 20,000 steps per day), M6 (water drinking, 3,000 cc per day), M7 (sleep, 9 elements), M8 (stress, 34 elements), M9 (food quality and quantity, 22 elements), and Daily life routines (for disease control and longevity, 22 elements); and

(3) MI and GHSU.

Figure lists numerical percentages of M1 through M10 among these four periods (Figure 6). It should be pointed out that the red numbers of Period A (2012-2014) are partial results of this

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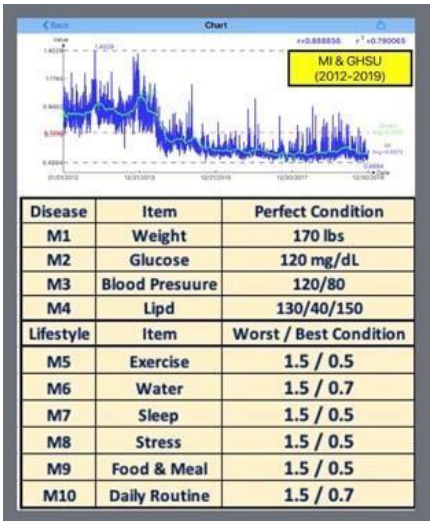
particular period due to missing data in the beginning of this time [2]. Therefore, the complete picture of Period A is not totally clear. However, all of the measured data from the other three periods have shown a declining tendency from Periods B through D, which signifies improvements of health conditions. The author adopted the common medical practice that smaller numbers generally indicate better results [3-5]. For example, his M1, weight, reduced from 183 lbs. (BMI 272) to 173 lbs. (BMI 25.5) and M2, average daily glucose, reduced from 131 mg/dL to 116 mg/dL. Other numbers shown in lower percentages showed improvement. Figure is a graphic bar-chart summarizing the comparison of four disease conditions and six lifestyle management categories among these four periods (Figure 7). Generally, disease control shows more obvious improvements than lifestyle management. However, lifestyle management is the "root cause" of metabolic disorders; therefore, it is more important but much harder to implement than controlling symptoms of the diseases. It should be re-emphasized here that all of those numbers after 2014 are under the "no medications" category.



Disease	Item	Perfect Condition
M1	Weight	170 lbs
M2	Glucose	120 mg/dL
M3	Blood Presuure	120/80
M4	Lipd	130/40/150
Lifestyle	Item	Worst / Best Condition
M5	Exercise	1.5 / 0.5
M6	Water	1.5 / 0.7
M7	Sleep	1.5 / 0.5
M8	Stress	1.5 / 0.5
M9	Food & Meal	1.5 / 0.5
M10	Daily Routine	1.5 / 0.7

Figure 1: Metabolism (2012-2019) and measurement standards (M1-M10).

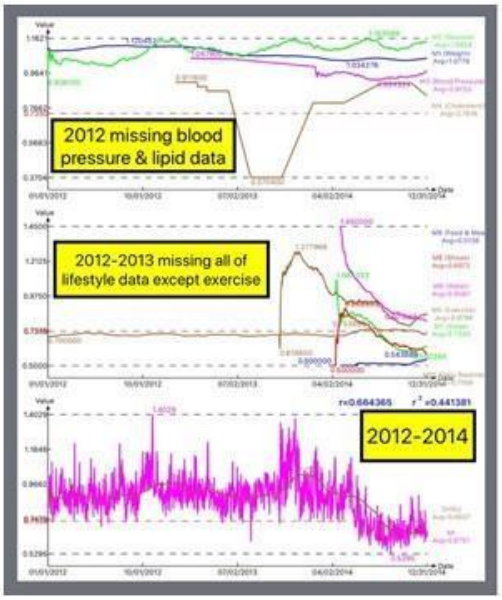


Figure 2: Metabolism charts of period A (2012-2014).

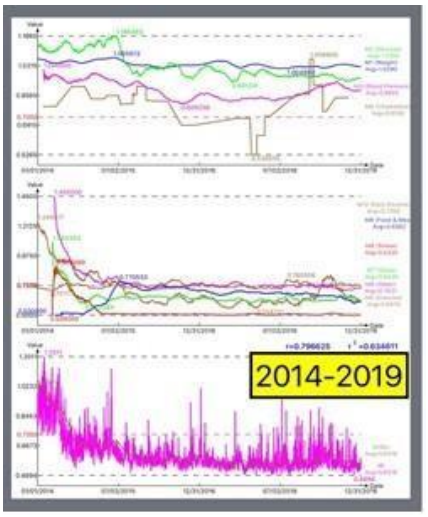


Figure 3: Metabolism charts of period B (2014-2019).

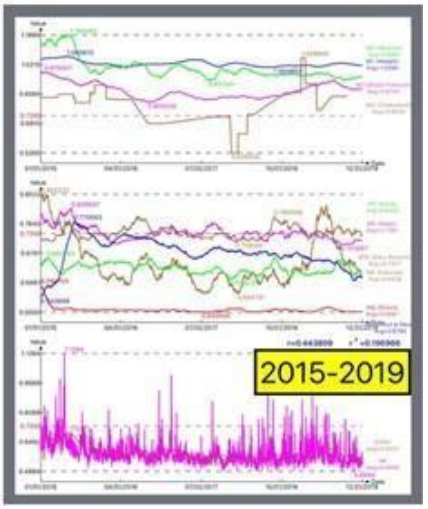


Figure 4: Metabolism charts of period C (2015-2019).

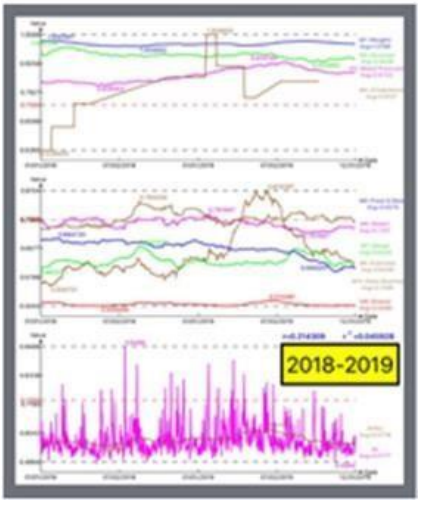


Figure 5: Metabolism charts of period D (2018-2019).

	2012-2014	2014-2019	2015-2019	2018-2019
M1	183	175	174	173
M2	131	122	120	116
M3	98%	89%	87%	87%
M4	76%	81%	80%	81%
	2012-2014	2014-2019	2015-2019	2018-2019
M5	98%	70%	65%	64%
M6	96%	76%	74%	73%
M7	73%	64%	63%	62%
M8	70%	53%	51%	50%
M9	51%	66%	68%	66%
M10	72%	74%	74%	74%

Figure 6: Numerical percentages of 4 periods (M1-M10).

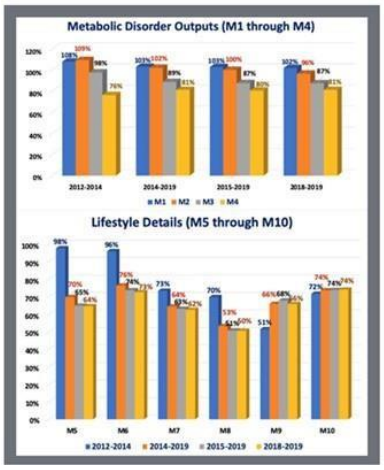


Figure 7: Metabolism Index bar-charts of 4 period A (M1-M10).

CONCLUSION

These period-based big data analytics calculation utilized a sophisticated mathematical metabolic model which has shown the effectiveness of chronic disease control via lifestyle management.

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