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Longevity Analysis by Using the Overall Metabolism and Life Routine Regularity via GH-Method: Math-physical Medicine

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Introduction

This paper describes one of the author's hypothetical theories of relationship between life longevity and overall metabolism (the macro-system view), including specifically the life routine regularity (a specific micro-category). 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 spent 24,000 hours over the past 9-years (2010-2019) to conduct his own research on metabolism, endocrinology, and chronic diseases, especially diabetes.

He spent the entire year 2014 to establish a mathematical model of metabolism which includes 4 output categories (weight, glucose, blood pressure, lipids) and 6 input categories (food, water, exercise, sleep, stress, life routine regularity). There are approximately 500 detailed elements included in these 10 categories. Since the "theoretical" and a complete set of their interactive relationships would be an immense task, which includes calculations of 500!, this step is a huge undertaking without any true benefit. Therefore, the author assigned various weighting factors and to seek important but partial interactions to investigate. By utilizing concepts and methods of topology, partial differential equation, nonlinear algebra from mathematics, and finite element method from engineering, he was able to define an approximated metabolism model with two newly defined variables, metabolism index (MI) and general health status unit (GHSU). This dynamic model can be expressed through these two variables to describe a person's health status at any moment of time.

Results

Period A, the year 2017 (1/1/2017 - 12/31/2017) was the "best conditions" period, i.e. lowest numerical scores (means the highest performance) on input category, output category, MI, and GHSU. Period B, from 1/1/2018 through 6/30/2019, is the "not-so-perfect conditions" period, i.e. higher numerical scores (means poorer performance) on all categories. During period B, the author has attended more than 35 medical conferences to present more than 60 medical papers. In addition, during this 18-month period, he wrote a total of 162 abstracts with 22 full-length articles published in various medical journals. As a result, during period B, he overworked himself at the cost of damaging his overall health, possibly shortening his life expectancy to some degree. Figures 1 through 5 show the performance comparison between the two periods graphically. Table 1 shows the performance numerical comparison. Although his MI score has only increased (means worsen) by 1.1%, most of his metabolism categories have the worst performance scores in period B.

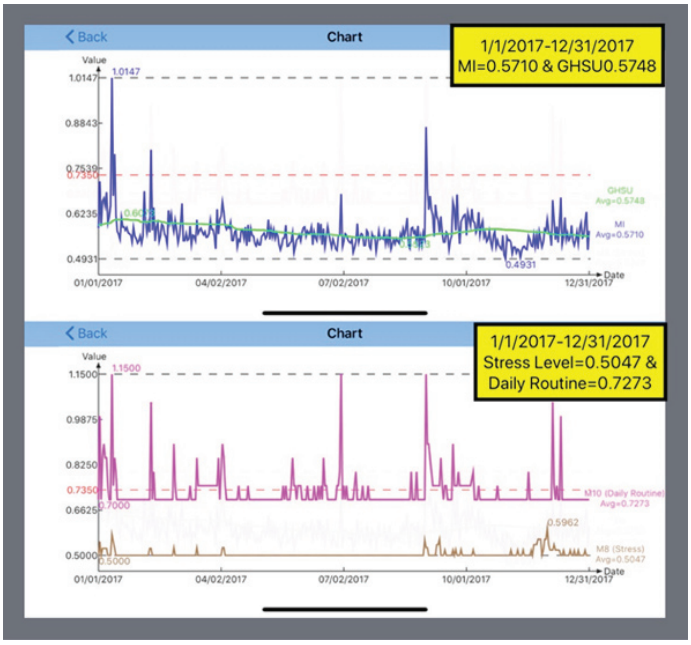

Figure 1: *MI/GHSU and Stress/Daily routine of Period A (1/1/2017 - 12/31/2017).*

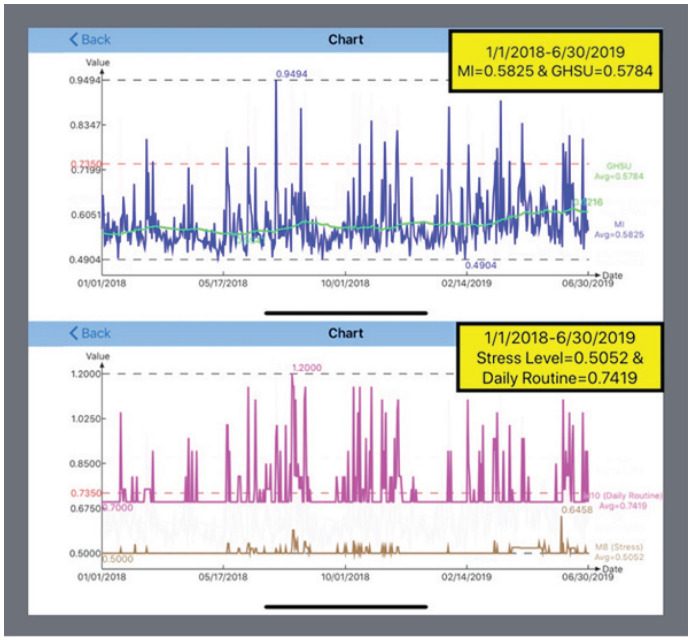

Figure 2: *MI/GHSU and Stress/Daily routine of Period B (1/1/2018 - 6/30/2019).*

Score	1/1/2019-12/31/2-17	1/1/2018-6/30/2019			
	Period A	Period B	Period B / Period A	Baseline	Baseline Explanation
MI	0.5710	0.5825	102%	0.735	MI: break-even
GHSU	0.5748	0.5784	101%	0.735	GHSU: break-even
Stress Level	0.5047	0.5052	100%	0.700	Stress: Best
Daily Routine Life	0.7273	0.7419	102%	0.500	Daily Routine: Best
Comparison %	Period score / Baseline				
	Period A / Baseline	Period B / Baseline	Period B / Period A	Baseline	Baseline Explanation
MI	78%	79%	102%	73.5%	MI: break-even
GHSU	78%	79%	101%	73.5%	GHSU: break-even
Stress Level	72%	72%	100%	70.0%	Stress: Best
Daily Routine Life	145%	148%	102%	50.0%	Daily Routine: Best

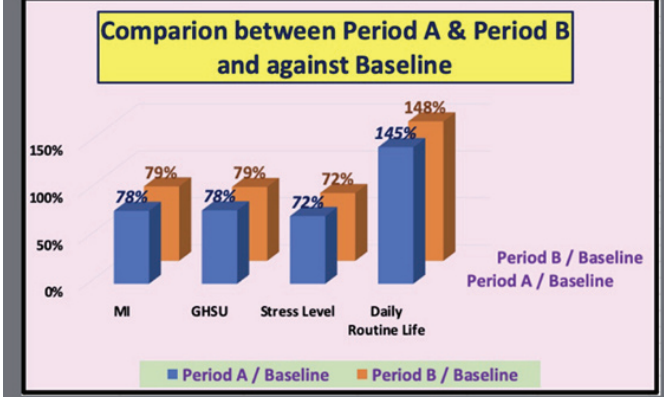

Figure 3: *Comparison between Period A and Period B (MI, GHSU, Stress, and Daily routine).*

Most research have shown that majority of people with long lives lived a simple but routine lifestyle. Therefore, let us focus on the category of "life routine regularity". The author's performance score for this specific category has increased (means worsen) by 1.98%. More specifically, this increased numerical score (i.e. worsen performance) is the combined results from air-flights, disturbance of food and exercise routines, weather and living environment changes, jet lag, and sleep pattern disturbance. It is quite interesting to find out that the author's stress level has no significant change. This is probably due to the fact that medical research work for the author is merely his personal hobby instead of the ways and means to make a living with the aim of fame, power, and money. In addition, he has not suffered any stress from a "boss" and meeting "deadlines" from his medical research like other working people at their jobs.

Conclusion

This big data analytics based on ~600,000 data over 2.5 years and his developed metabolism model have shed some light about the impact on his life longevity due to his overall metabolism changes, especially his life routine regularity. Based on the findings from this specific analysis, the author has decided to change his forthcoming lifestyle and work on a different method to conduct his important

medical research and find a better way to distribute his research results.

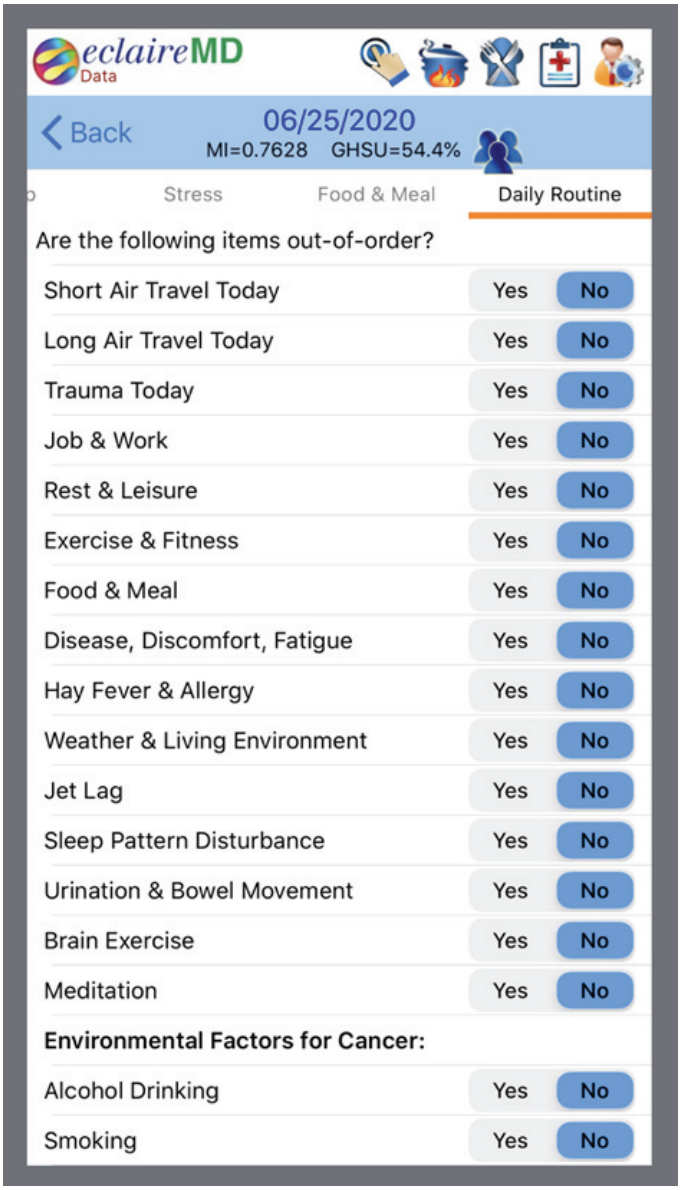

Figure 4: *Daily life routine.*

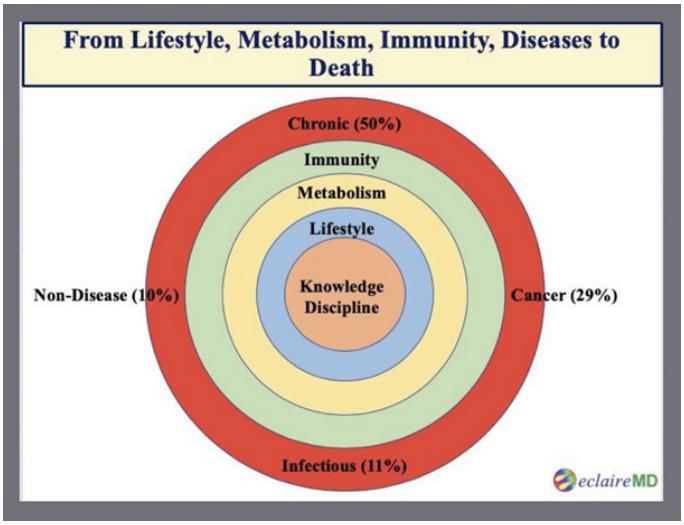

Figure 5: *From lifestyle through metabolism, immunity, diseases and then death*

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