The Metabolic State

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Energy availability is important because it is a factor of feedback reflexes, for example negative feedback on intestinal nutrient absorption [1-3] as well as positive feedback on immunogenic bacteria growth in the alimentary canal [4]. The best (most approximate) index measuring energy availability is Blood Glucose concentration (BG) [5-8]. In blood, glucose is an important portion of all energy availability and is correlated to the other nutrients in blood. BG outflows earlier and more completely from blood than other nutrients. Preprandial BG has 3.8 mg/dl variability in an individual (confidence interval). Mean Blood Glucose (MBG) is calculated from 21 preprandial measurements and can be reported by a week diary. MBG is associated with energy intake, with Resting Metabolic Rate (RMR), with energy balance and with insulin resistance [6-9]. Why MBG has such central role in energy metabolism? Fasting BG has by no means such metabolic correlation. MBG origins as a series of BG measurements taken at the 21 moments (in a week) of formation of the will to eat before meals, thus it is strictly personal. MBG asserts the metabolic moment in BG levels that the patient considers as the best for restoring the energy availability that he personally prefers, wants. MBG reveals the preference for a definite energy availability between the extremes of low BG and the development of diabetes. The will to eat may be automatic (conditioned reflex), but automatism and partial conscience do not change the level and importance of the choice. Mean BG is as an index of the individual metabolic state: of energy intake, of RMR and of balance and of insulin resistance. The habitual BG choices are stratified in the population. Our educative efforts were all directed toward the creation of high awareness on the current availability and about intake amount of energy to maintain insulin sensitivity. Awareness allows the constructions of intake habits that maintain steady, appropriately low BG levels associated with insulin sensitivity and stable body weight [8]. Trained people let arise Initial Hunger (IH) three times per day and IH arousals correspond to 76.6 ± 3.7 mg/dL [8]. About a third of investigated subjects freely chose and show these levels at recruitment, before any suggestion or teaching or training [10]. This third of population was found in adults as well as in infants and children. We enlarged the number of people who show low preprandial BG by an appropriate training (IHMP). The initial hunger meal pattern (IHMP) was devised to reduce bacterial growth and reduce the mucosal immune response at nutrient absorption [4-8,11]. The role of bacterial growth, may be fully understood if we consider that more than 50% of immune cells in human body are located in the small intestinal mucosa [12].

The vast majority of the thousand bacterial species and of the 100 trillion intestinal bacteria are innocuous [12-14]. Abundance of nutrients in the alimentary canal increases bacterial growth that can be modest in the total number, that is so huge. Bacterial overgrowth implies an increase for all bacterial species [13,14]. Bacterial immunogenic and harmful species increase from 5% to 15% of all species [15]. This bacterial overgrowth develops when energy dense food is largely available. Thus, I studied bacteria number on intestinal mucosa in time after last meal [4]. A longer interval from the meal (skipping the dinner) produced a decrease in bacteria number on mucosal biopsies. An increase in preprandial blood glucose (BG) is associated with a slowdown of meal absorption, with increased bacteria growth on intestinal mucosa, with mucosal and overall immune stimulation [1-4]. Energy balance directly affects these correlated variables either increasing or lowering the conflict between bacteria activity and mucosal immune response. This conflictual state between bacteria and mucosa has been confirmed [16].

Bibliography

1.   Ciampolini M. "Influence of environmental temperature on intestinal absorption xylose in rats in vivo". *IRCS* 2 (1974): 1545.

2. Ciampolini M. "Influence of environmental temperature on xylose absorption in man". *IRCS Medical Science* 4 (1976): 208.

3. Ciampolini M. "Influence of environmental temperature on xylose absorption test in children and adults". X International congress of Gastroenterology. Budapest (1976).

4. Ciampolini M., *et al*. "Microflora persistence on duodeno-jejunal flat or normal mucosa in time after a meal in children". *Physiology and Behavior* 60.6 (1996): 1551-1556.

5. Ciampolini M and Bianchi R. "Training to estimate blood glucose and to form associations with initial hunger". *Nutrition and Metabolism (London)* 3 (2006): 42.

6. Ciampolini M., *et al*. "Sustained self-regulation of energy intake. Loss of weight in overweight subjects. Maintenance of weight in normal-weight subjects". *Nutrition and Metabolism (London)* 7 (2010): 1-4.

7. Ciampolini M., *et al*. "Sustained self-regulation of energy intake. Initial hunger improves insulin sensitivity". *Journal of Nutrition and Metabolism* (2010).

8. Ciampolini M and Sifone M. "Differences in maintenance of mean Blood glucose (BG) and their association with response to Recognizing Hunger". *International Journal of General Medicine* 4 (2011): 403-412.

9. Ciampolini M., *et al*. "Interruption of scheduled, automatic feeding and reduction of excess energy intake in toddlers". *International Journal of General Medicine* 6 (2013): 39-47.

10. Ciampolini M. "Meal by meal dynamic balance of energy in blood".

11. Ciampolini M. "Interruption of automatic feeding, of fattening and associated immune deficiency". *Recent Research Developments in Nutrition* 9 (2013).

12. Mowat A McI. "The cellular basis of Gastrointestinal Immunity". In: Marsh MN Ed, Immunopathology of the Small Intestine. Wiley J and Sons, Chichester UK.

13. Lynch SV and Pedersen O. "The Human Intestinal Microbiome in Health and Disease". *New England Journal of Medicine* 375.24 (2016): 2369-2379.

14. Mccoy K and Köller Y. "New developments providing mechanistic insight into the impact of the microbiota on allergic disease". *Clinical Immunology* 159.2 (2015): 170-176.

15. Van der Waaij LA., *et al*. "In vivo IgA coating of anaerobic bacteria in human faeces". *Gut* 38.3 (1996): 348-354.

16. Cooper IF and Siadaty MS. 'Bacteriums' associated with 'Blood Glucose Level Finding': Bio Med Lib Review (2014).

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