

Misunderstanding on Subjective Events

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Received: December 14, 2017; **Published:** February 12, 2018

Abstract

The meal and energy intake may be considered subjective events: the decision about onset, content and end are subjective. At meals, people aim to maintain their usual energy level and balance in blood and all tissues. This aim is an important variable in characterizing alimentary customs. The habit to measure blood glucose just before meals (MBG) assesses this variable. Yet the food with its energy and its use through the day are quite biochemical events. The biochemical measurements accurately let emerge differences like those between conditioned and after suspension of meals that otherwise remain closed in the mind.

Keywords: *Blood Glucose; Diabetes; Insulin Resistance; Overweight; Fattening; Energy Balance; Energy Intake; Limit in Energy Intake; Hunger; Meal Onset; Energy Availability; Bowel disorders; Malnutrition*

Abbreviations

BG: Blood Glucose, an index of energy availability in blood for the whole body; OW: Overweight, BMI > 25; NW: Normal Body Weight, BMI under 25; BMI: Body Mass Index: body weight in kg divided by squared height in meters; IHMP: Initial Hunger Meal Pattern: Energy intake is adjusted to three arousals of IH per day; IH: Initial Hunger consists of gastric pangs or mind or physical weakness. In sedentary adults and in children, IH corresponds to low BG: 76.6 ± 3.7 mg/dL; High BG is over 81.8 mg/dL and Low BG is a BG below 81.8 mg/dL, respectively associated with insulin resistance and insulin sensitivity; MBG: The mean of 21 BG measurements before the three main daily meals reported by a week-diary. MBG reproducibly measures the compliance with IHMP, the changes after training and is negatively correlated to insulin sensitivity. Below 81.8 mg/dL (Low BG) MBG indicates a healthy meal pattern in sedentary people. Over 81.8 mg/dL MBG is associated with fattening/insulin resistance; NSV: Non-Starchy Vegetables, food with lower content than 30 kcal/100 grams

Introduction

The meal and energy intake may be considered subjective events: the decision about onset, end and content are subjective. At meals, people aim to maintain their usual energy level and balance in blood and all tissues. People have subjectively refined this aim through poorly conscious months and years, i.e., outside any comparison with other people, other times or feeding conditions (Figure 1, 2) [1,2]. The preprandial weekly mean blood glucose (MBG) can assess this individual aim that differs from other people in the general fattening/diabetes development [2,3]. The position of this pathogenic development in the overall stratification shows how healthy/unhealthy is the subject's energy imbalance.

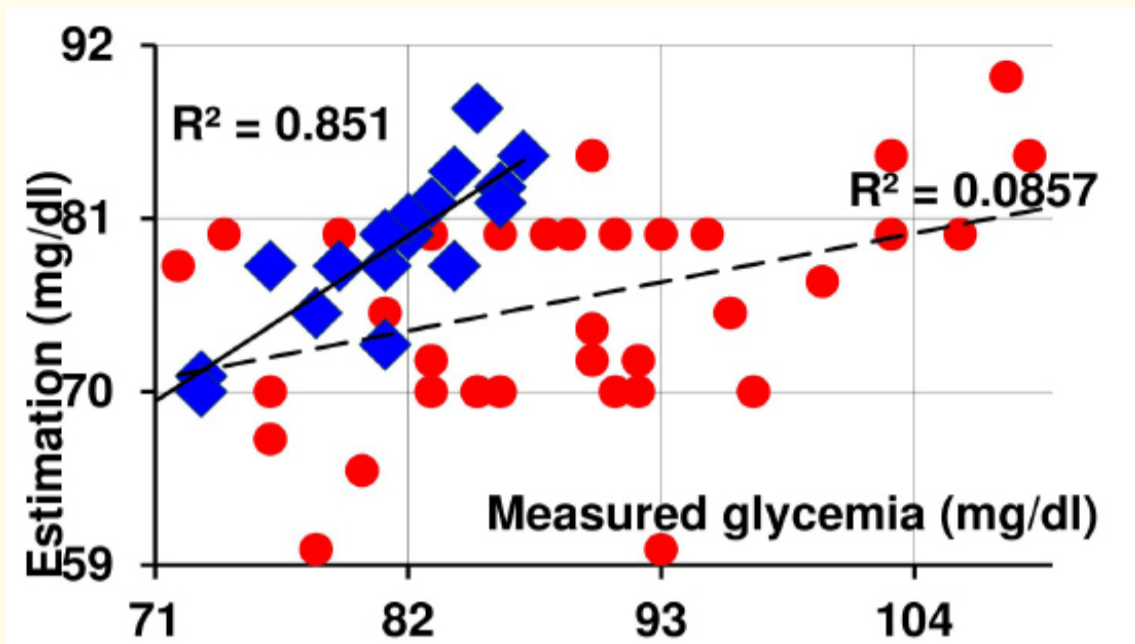


Figure 1: Estimated vs. measured blood glucose of subjects reporting to be hungry at the final laboratory investigative session. Blue rhombs, trained hungry subjects (n = 18). Red circles, control, untrained, hungry subjects (42).

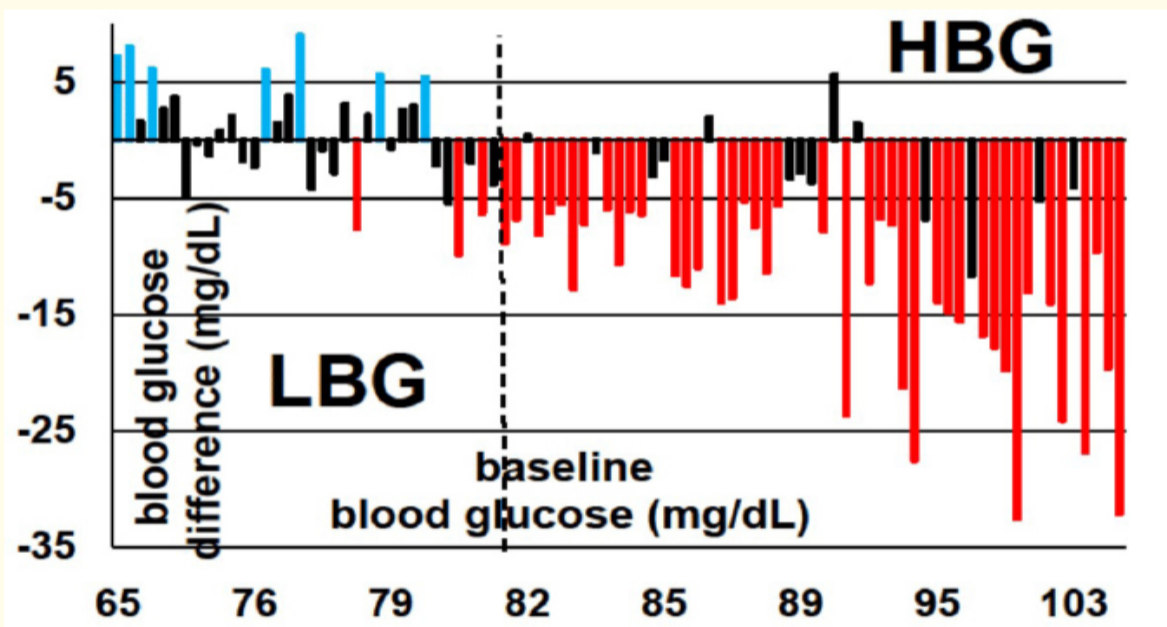


Figure 2: Difference of mean preprandial BG after training versus BG at recruitment for each trained subject. Notes: Column height shows 5 months after pretraining mean BG difference in each trained subject. Significant increases are indicated by blue bars, significant decreases by red bars, and not significant changes by black bars. Mean BG is reported in sequentially increasing order at recruitment, not in linear correlation with segment length on the X-axis scale. The range of mean blood glucose values at recruitment is indicated by the minimum and maximum values for the first and last subjects (large arrows). The vertical dashed line indicates the most significant division between subjects who showed no mean BG decrease after training (low BG group, n = 34) and those who showed significant decrease of mean BG (high BG group, n = 55; Chi-squared analysis: P = 0.00001). This threshold blood glucose at recruitment (demarcation point) is 81.8 mg/dL (4.54 mmol/L) at recruitment in the randomized controlled studies. Subjects above this threshold accounted for most of the improvements in weight and insulin resistance [2]. Subjects below the threshold show the blood glucose of 76.6 ± 3.7 mg/dL Copyright © 2011, Dove Medical Press Ltd. Reproduced with permission from Ciampolini M, Sifone M [2]. Abbreviations: BG: Blood Glucose; HB: High Blood Glucose; LBG: Low Blood Glucose.

From subjectivity to biochemical assessments

After 2 - 48 hours of meal suspension, the aim arises as Initial Hunger (IH). Recognition of three IH arousals per day produces an even energy balance and eliminates any conditioned intake [1-3]. This seemed as a useful chance to reverse current trends in overweight spread increase. Two reliable authorities (NIH and NEJM) noticed that already, all dieticians instructed to notice hunger arousal before meals to limit energy intake for body weight loss. Conditioned hunger consists in the same gastroduodenal peristaltic movements that characterize hunger after meal suspension (IH). The main difference resides in the onset: either before or after noticing meal cues (laid table). Did mothers and dieticians focus meal onset when reporting no food offering? What did dieticians ascertain about the demand signal by the child or the adult? Did the child's demand consist in walking, crying, indicating, mood change or searching for food? After usual scheduled time, how long did mothers (and adults for themselves) wait before responding to a food demand from their child? Did mothers try to distract child from food? Did mothers and adult subjects use a portable device to measure BG? How long before meals, the adult subject did perceive the hunger sensation? Did adult subjects report gastric sensations or physical weakness before the meal? The mean absolute error (difference between BG estimation and measurement) was 5.7 mg/dL in 85 comparisons by the portable device from the autoanalyzer measurements [1-3]. This mean error was an overestimation (too high) because it included two overtly erroneous differences. Although high, 5.7 mg/dL is an error that allows definite conclusions. Low BG was 76.6 ± 3.7 mg/dL and this value sharply distinguished IH from conditioned intake. Yet, the proposed Initial Hunger Meal Pattern (IHMP) did not rely on BG measurements, but consisted in sometimes checking subjective mothers' evaluation by BG measurement. Adjusting energy administration to the planned IH arousals was successful most of the times [2-4]. Mothers gave a large milk amount and delayed meal demand. Any added energy rich administration proportionately delayed IH arousal. Using this rule and relying on accurate estimation of current BG, trained adults obtained a coincidence about hunger arousal and the planned meal onset more than 90 % of times. This way, subjects curbed conditioned intake and the trained meal pattern decreased energy intake, MBG, RMR, TEE and insulin resistance for about 15% - 30% together with body weight decrease [2,3]. These results correspond to prevention of vascular and malignant diseases.

At last comparison of many controlled, randomized investigations, the association between changes in body weight and changes in meal pattern suggested that subjects actually used IHMP for all 5 months of the training [1]. Adults had to learn and reach the coincidences between IH sensation arousal and mealtime planning. Members of SSIB already questioned how such coincidence was possible. Homo sapiens are capable to recognize sensations like the red color from the black color and headache from abdominal pain. Homo sapiens are able to recognize many more sensations than the well-known 6 senses: sounds, rhythms, figures. Accurate estimation of current BG after training demonstrated the learning sensations of current energy availability. Homo sapiens may admit that these recognition activities remained useless and neglected for long time like the internal regions of New Guinea. Unexplored sensations do not mean that hunger sensations do not exist or have to remain outside the realm of science, much more that the sensations are associated with 20% reduction in intake, an amount that changes human life.

Unfortunately, a good nutrition requires also physical activity and dilution of energy by NSV to stop energy intake. A three factors use (Time, energy intake and vegetable intake) is an error in a scientific comparison study. The three factors association might be more effective on health than the sum of their separate effects. We preferred to be of help for mothers and for children who asked advice than improving the success chances of the research. The increase in not starchy vegetables (NSV) intake partly contributed to lower energy intake and body weight decrease. Further body weight decrease was possible only after the MBG decrease [4] that is associated with recognition of Initial Hunger (IH). The conditioned intake suppression was actual and effective.

The attraction power of conditioned intake may be overestimated. The attraction power of conditioned meals is weaker than the hunger that emerges after eating suspension. Conditioned meal attraction easily fades for change in attention objective. The conditioned attraction may be sufficient for eating in association with insulin resistance for long time and large part of population. Two overweight diabetic people maintained low intake (200 to 400 kcal per day) for months. Difficulties emerged in the confrontation with population. People asked if the overweight/diabetic subject was celiac because he did not eat bread and pasta. Living seems to consist in consuming energy rich food for most people. Children require an education to control (contrast) the preference for energy rich food. Intake of essential principles is small when meal energy is high [5,6]. All population has to increase familiarity with energy content of food, energy expenditure in different environments and has to improve estimation of current energy availability. Intake of only 100 grams of meat and

200 - 300 grams vegetables was even sometimes sufficient for a child meal, although the energy content is poor. Relatives easily blamed mothers by noticing prevalent NSV intake by child. Yet every energy intake over an even balance has an immune price, a damage that may be small as well as large.

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Volume 13 Issue 3 March 2018

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