

The individual meal pattern

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Mario Ciampolini

Department of Paediatrics, Università di Firenze, Italy

Correspondence: Mario Ciampolini, Preventive Gastroenterology Unit, Department of Paediatrics, Università di Firenze, Florence, Italy, Email mlciampolini@fastwebnet.it

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Opinion

I was criticized by ASN for assessments based on portable devices. Portable devices are unreliable. When I started my long research, I considered single BG measurements as inconsistent and the BG wavering destitute any meaning to the measurements. The liver delivers glucose into blood every 12 minutes. Physical activity, a gram of sugar, a heavy concern, all increase BG. We do not know the onset of the post-absorptive period, that also declines lowly, slowly. I retained that we could better rely on the mean of many measurements during a period. Single measurements were incorporated in collective, weekly assessments (Mean BG). At recruitment, the BG means of 120 investigated subjects showed SDs of 5 to 10 mg/dL that corresponded to confidence limits of 3.84 mg/dL at $P < 0.05$. We could stratify the 120 subjects in ten small strata. Each stratum contained subjects without differences in Mean BG but significantly different from all other strata. We might say that each subject is imprisoned in his/her own stratum and maintains a steady meal pattern to maintain a steady BG. Figure 1 shows Mean BGs in increasing sequence: The high Mean BGs are associated with insulin resistance. These assessments on Mean BG were taken before any training on Initial Hunger (IH) and again after 5 months from training.

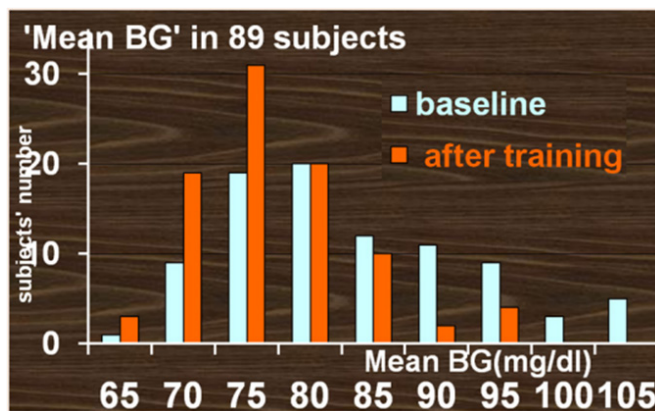


Figure 1 Increasing sequence of Mean BGs of all 89 trained subjects divided into ten strata (columns) at recruitment and into 8 strata 5 months after training.

Notes: Strata consist of subjects with no significant difference in mean BG inside the stratum. Moreover, each stratum excludes subsequent subjects whose mean BG is significantly higher than that of the first subject in the stratum. Column height shows the first component. Mean BG is reported in sequentially increasing order at recruitment, not in linear correlation with segment length on the x-axis scale.

Abbreviation: BG: Blood Glucose. Mean BG: Mean of 21 preprandial measurements by portable device reported by home week diary.

Mean BG characterizes the meal pattern of an individual on the most important variable, on the balance maintenance. We asked patients to measure blood glucose before meals to protect them from hypoglycaemia and to verify different compliance with instructions. Energy intake decrease might inform equally on compliance but this did not appear as true. Sometimes the patient was reliable in his

assertion on accurate distinction of the prescribed hunger after eating suspension from conditioned hunger but energy intake showed no significant pre/post difference. Overweight subjects were capricious, sometimes they engaged in food restriction at recruitment and were incapable of any further decrease after training. In our hands, the measurement by a portable device was reliable. We measured BG by a portable potentiometer for whole BG measurement with the exokinase method: Glucocard Memory; Menarini diagnostics; Florence, Italy). The adult subject had to personally measure BG with the portable instrument against the autoanalyzer in the lab as he/she did at home. At blood sampling, we supervised the performance of the comparison. The autoanalyzer was checked every morning in comparison with the other 50 laboratories in Tuscany. A difference in BG from the mean had to remain within 1% every day. The heparinized blood sample for the autoanalyzer was immediately centrifuged and measured with the exokinase method. The meantime, the patient performed his/her measurements on the same blood sample by glucometer. The autoanalyzer obtained a mean±SD of 89.9±11.3mg/dL (N=85). Subjects measured 89.0±12.5mg/dL. The mean difference (0.9±7.1) was not significant. On absolute values, the mean difference was: 5.7±4.3mg/dL with no bias. This error is low compared to the spontaneous BG wavering of 10% every 12 minute. However, single measurements by portables were useful for personal assessments and to validate current hunger sensations and for adjustments in meal energy. In scientific demonstrations,¹⁻⁶ I used Mean BG, the mean of 21 preprandial measurements reported by 7 d food diaries. The confidence interval around this value is 3.84mg/dL: the value is much more stable and reliable than single measurements by a portable. This preprandial BG wavering is minute in comparison with the “normal” BG excursions from 65 to 100mg/dL.

Acknowledgments

None.

Conflicts of interest

Author declares that there is no conflict of interest.

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