INTER- AND INTRA-LABORATORY VARIABILITY OF GLYCEMIC AND INSULINEMIC INDEXES

Topic 2 Advances in dietary studies, methodology and design
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INTRODUCTION

• Glycemic Index concept has been defined by Jenkins et al in 1981 to rank products according to the glycemic response they induce;
• Two interlab studies have been done in the past : inter-laboratory SD was 9.0 in both studies
• Several publications have shown and discussed the high variability in Insulin measurements (results depend on the method/kits used) ➔ some work started to homogenize these methods but nothing finalized yet

OBJECTIVES

The aims of the present study were:
– To harmonize the protocols and methodologies used in 3 different labs, except for glucose measurements to reduce interlab GI variability
– To evaluate GI, II and several parameters of glycemic and insulinemic responses
– To evaluate the Inter- and Intra-laboratory variabilities ➔ evaluate the level of comparability of these parameters between labs

METHODS / DESIGN

• Multicenter (3 labs), randomized, open study performed on at least 15 subjects per lab
• several criteria added to recruit healthy normal-weight subjects with very low risk of metabolic alterations
– 18 to 45 years old (mean age of the population = 25.7 ± 0.6 y)
– BMI between 19 and 25 kg/m² (mean BMI of the population = 22.8 ± 0.2 kg/m²)
– Normal glucose tolerance and insulin sensitivity (HOMA-IR < 1.7) (mean HOMA-IR of the population = 0.90 ± 0.03)
• 3 reference glucose sessions + 6 cereal products to cover the whole range of GI

RESULTS

Fig. 1: Products chosen for the study

Fig. 2: Glycemic Index (GI) results

Fig. 3: Insulin Index (II) results

Fig. 4 : Intra-laboratory variability of glycaemia

Both Inter- and Intra-laboratory Coefficient of Variability were < 30% in the 3 labs for glycaemia. These latter were greater for insulinemia.

CONCLUSIONS

• Glycemic Index : Based on harmonized GI method between lab, we can discriminate products based on the glycemic responses they induce
• Insulin Index : significant lab * product effect on insulin index ➔ difficult to compare; Moreover, high intra-laboratory variability (both intra- and inter-individual) was observed.
➔ Glycemic Index appears as having a good reproducibility and comparability between labs
➔ Need to investigate further and to standardize insulin methodologies