INCORPORATION OF NON ESTERIFIED FATTY ACIDS INTO QUICKI IS NOT RELEVANT IN OBESE SUBJECTS DURING DIET INDUCING WEIGHT LOSS

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Recently, a new formula for assessing insulin sensitivity from both fasting plasma glucose and insulin called “QUICKI” for quantitative insulin sensitivity check index was published [1]. QUICKI was better correlated to the gold standard hyperinsulinemic glucose clamp [2] than other indexes such as the minimal model index [3] or the homeostasis model assessment [HOMA] [4]. More recently, Perseghin et al. [5], by incorporating fasting plasma non esterified fatty acids (NEFA) concentration into QUICKI improved this correlation and its discriminatory power in case of mild insulin resistance. However, no data are currently available about the influence of nutritional variation on the QUICKI revised. We compared QUICKI and QUICKI revised in 23 (5 men, 18 women) non-diabetic obese subjects (age: 47 ± 3 years) before and after a 3 weeks very low calory diet program (941 ± 27 kcal per day with 45% of carbohydrate, 20% of fat and 35% of proteins). Fasting plasma glucose was assayed enzymatically (hexokinase) using a multiparametric analyser (Hitachi 911, Boehringer Mannheim, Meylan, France). Plasma insulin concentrations were measured using commercial radioimmuno-assay kits (Bi-Insulin IRMA, ERIA-Pasteur, Paris, France). NEFA were determined with a commercially available kit (NEFAC test, Wako Chemicals, Neuss, Germany). A body composition analysis by dual X-ray absorptiometry was performed in the non-diabetic obese subjects participated to the VLCD program, using the QDR 1000 from Hologic (Waltham, MA, USA). Results are mean ± SE and differences between groups were determined using non parametric Wilcoxon rank test. The threshold for significance was set at p = 0.05.

VLCD induced a 6.5% weight loss with a 6.8% fat reduction (Table I). We observed a significant reduction in both fasting plasma glucose and insulin levels.
after 21 days VLCD by 7.3% and 26% respectively associated with a 34% significant increase in plasma FFA level. We found a 4.6% increased QUICKI suggesting an improvement of insulin sensitivity as previously reported in a clamp study performed in obese non-diabetic and type 2 diabetic patients during a similar VLCD program [6]. By contrast, the QUICKI revised did not change after VLCD suggesting no improvement in insulin sensitivity after weight loss. However, we must keep in mind that in a situation of diet restriction, fasting NEFA reflects mainly the lipolysis induced by diet rather than the resistance of the antilipolytic effect of insulin. Therefore the QUICKI revised is probably a useful index for insulin sensitivity assessment in stationary nutritional state but not when the NEFA variation is induced by weight loss or nutritional manipulation.

REFERENCES

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