EFICACY, SAFETY AND METABOLIC EFFECTS OF CARBOHYDRATE RESTRICTION IN THE TREATMENT OF OBESE ADOLESCENTS

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The authors have nothing to disclose

Introduction:

- Available experience regarding the modification in the proportions of macronutrients for the treatment of obesity in adolescents is limited.
- Dietary carbohydrate restriction could cause a substantial shift in the substrates preferentially used as energy source, thus inducing modifications on body composition and, together, expected to determine metabolic changes in obese adolescents.

Objectives:

To evaluate the effect of dietary carbohydrate restriction for 6 months in obese adolescents on:

1) Body composition
2) Parameters of carbohydrate metabolism
3) Lipid profile

Patients and methods:

- Out of a group of 110 obese Caucasian adolescents recruited and visited monthly, thirty-six completing a minimum follow-up of 6 months were studied. This subgroup was made up of 22 girls and 14 boys and their mean age and BMI were 15.8 ± 1.5 years and +4.72 ± 2.80 BMI-SDS, respectively.
- Patients were randomly assigned to two different nutritional interventions, both affording similar caloric supply (1500 kcal/day) but differing in the relative proportion of macronutrients: limited carbohydrate diet (L-CH, n=19, 10% daily energy supply from carbohydrates, 60% from fat and 30% from proteins for 4 months and, after the fourth month, 30% from carbohydrates, 50% from fat and 20% from proteins) *vs.* unrestricted (normal) carbohydrate diet (N-CH, n=17, 52% daily energy supply from carbohydrates, 30% from fat and 18% from proteins, during the 6 month period).
- Patients were studied at recruitment (R) and after 3 (3M) and 6 months (6M). BMI, body composition (as measured by bioimpedance analysis [BIA], Tanita® BC-420MA), glycemia, insulinemia, HOMA index, lipid profile, uric acid and serum 25[OH]vitamin-D levels were analyzed in every time-point.

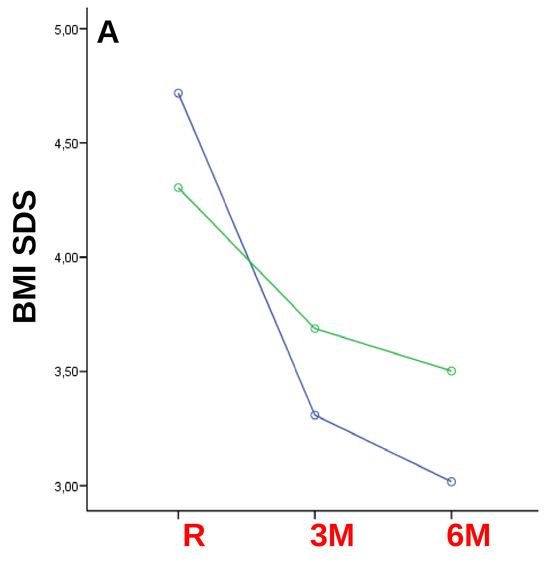
Results:

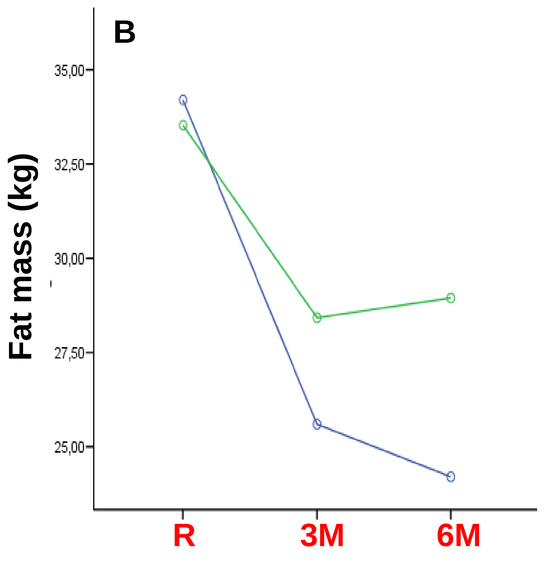
- Both groups significantly reduced their BMI-SDS from R to 6M ($p < 0.001$), although this reduction in BMI was more intense in the L-CH group (-1.70 ± 0.98 *vs.* -0.80 ± 1.09 BMI-SDS in the N-CH; $p < 0.05$). This decrease in BMI was mainly achieved in the first 3 months of dieting (-1.41 ± 0.71 *vs.* -0.62 ± 0.78 in the N-CH; $p < 0.001$) as the BMI-SDS evolution between 3 and 6 months was similar. This loss in BMI was due to a decrease in fat mass (Figures A & B).
- A transient rise in serum uric acid levels was observed in the L-CH group at 3M ($p < 0.01$), which normalized at 6M (Fig. C).
- HOMA index improved significantly exclusively in the L-CH group at 6M (-1.75 ± 1.48 vs. +0.15 ± 1.25 in N-CH; $p < 0.001$), despite both groups achieved significant weight reduction (Figure D).
- In contrast, both groups showed a similar increase in serum 25[OH] vitamin-D levels after attaining weight loss at 6M ($p < 0.001$, Figure E).
- No significant differences within or between groups were observed in the evolution of the components of the lipid profile studied.

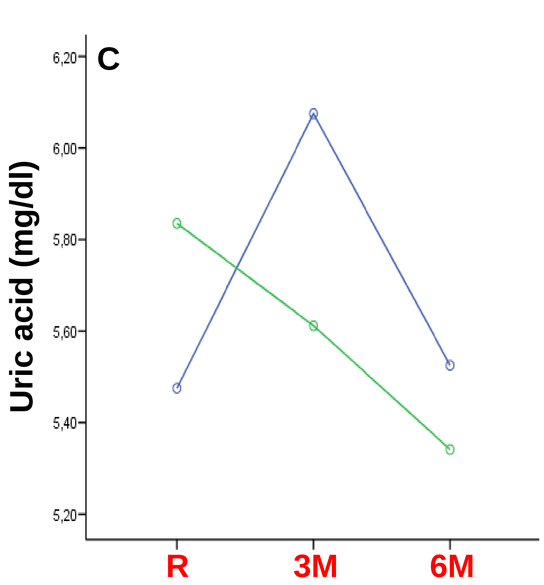
Limited Carbohydrates

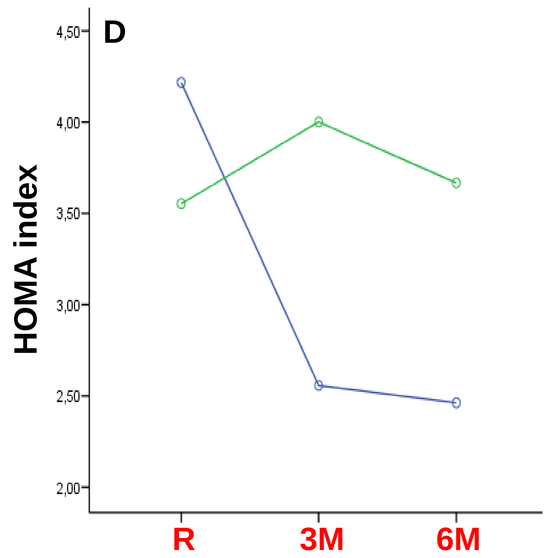
Normal Carbohydrates

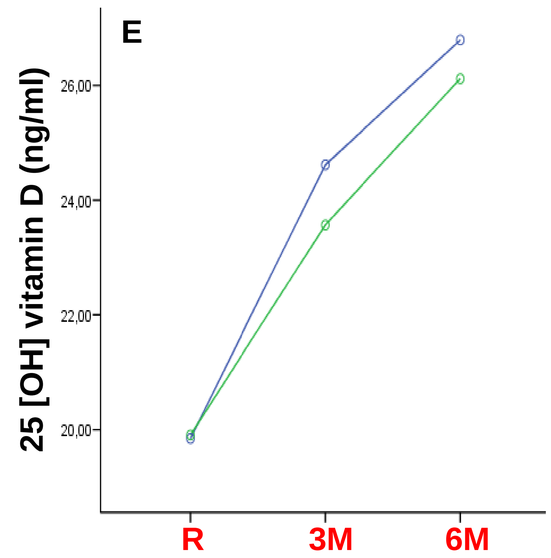
R: Recruitment
3M: 3 months follow-up
6M: 6 months follow-up











Conclusion:

- Diet carbohydrate restriction results in a more intense weight reduction and insulin resistance improvement in obese adolescents after 6 months of treatment.

Acknowledgements: This study has been funded by FEDER and PI13-02195 (Fondo de Investigación Sanitaria) and CIBERobn (ISCIII) funds.

DOI: 10.3252/pso.eu.55ESPE.2016

Poster presented at: ESPE 2016 PARIS