DIABETOLOGY & METABOLIC SYNDROME

MEETING ABSTRACT Open Access

The impact of sustained hyperglycemia, metabolic memory and hba1c variability in the development of chronic complications in patients with type 1 diabetes

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Background

Sustained hyperglycaemia has been linked to the development of chronic complications of type 1 diabetes (T1D) in most populations, especially if it occurs in the first few yrs. of the disease. However, this has been poorly studied in the Brazilian multi-ethnic population.

Objectives

To assess if there is an association between the development of chronic complications (retinopathy-DR, nephropathy-DN, peripheral neuropathy– PN and cardiac autonomic neuropathy-CAN) in patients with T1D and 1) the mean glycated Haemoglobin during their follow-up since diabetes onset (mHbA1c); 2) the standard deviation (SD) of HbA1c over this period, 3) the HbA1c in the first 3 yrs. of disease (1st 3 yr.) and 4) the current HbA1c.

Materials and methods

This retrospective study included patients with T1D ≥5 yrs. that were followed in a specialized center. Epidemiological, clinical and laboratory data were obtained by reviewing the medical charts. mHbA1c, HbA1c in the 1st 3 yr of T1D and SD of HbA1c were calculated. DR was evaluated by ophthalmoscopy. Increased urinary albumin excretion (IUAE) was defined according to the ADA criteria. CAN was diagnosed through a Questionnaire and Variability of heart rate tests. PN was defined by Neuropathy Symptoms Score and Neuropathy Disability Scores.

Results

199 patients were assessed (54.7% women) with mean age and T1D duration of 27.9±9.7, 17.1±7.3 yrs., respectively. Their mean mHbA1c was 8.38±1.58%. DR, IUAE, PN and CAN were seen in 10.8% (12/111), 17.7% (33/188), PN in 35% (23/64) and CAN in 31.3% (33/107). Patients with IUAE had higher mHbA1c levels than others (8.95±1.53 vs. 7.99±1.18; p=0.010). MhbA1c also differed between those with PN and others (9.12±1.82 vs. 7.65±0.93; p=0.001). Although there was no association between mHbA1c and DR, the mean HbA1c in the last 10 yrs. was higher in those with DR than others (7.98±1.25 vs. 9.68±1.85; p=0.001). The SD of HbA1c was also higher in those with DR and CAN than those without these complications (p=0.004 and p=0.003, respectively). The HbA1c 1st 3yr. was higher in patients with DR (12.41±5.06 vs. 7.33±0.86; p=0.001) and in those with DN (9.35±0.45 vs. 7.71±0.81; p=0.036) than others. Current HbA1c (8.35±1.56) was not associated with either of these complications.

Conclusions

Sustained hyperglycemia, especially in the first years of the disease, and HbC1c variability over time have been linked to the development of chronic complications in our population.

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