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HBA1C RATHER THAN BMI, LIFESTYLE AND ADHERENCE TO MEDITERRANEAN DIET IS THE MAJOR DETERMINANT OF TRIGLYCERIDE/HDL CHOLESTEROL RATIO IN ADOLESCENTS WITH TYPE-1 DIABETES

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INTRODUCTION

Triglyceride/HDL Cholesterol ratio (TG/HDL C) has recently been considered a significant index of cardio-metabolic risk in healthy and obese subjects both children and adults. Cardiovascular disease is the 1st cause of death in patients with type-1 diabetes (T1DM)

OBJECTIVE AND HYPOTHESIS

The major determinants of belonging to a risk group of TG/HDL C ratio in adolescents with T1DM are not known. Diet, lifestyle indexes, anthropometric parameters and metabolic control are the theoretical variables with possible influence on belonging to a certain TG/HDL C risk group. Primary objective of the study was to identify whether HbA1c per se has an influence on TG/HDL C and furthermore to identify other possible variables influencing the ratio.

METHODS

We evaluated 85 adolescents with T1DM followed-up in our centre. Inclusion criteria were age range 12-19.9 yrs and T1D with at least 2 yr duration. Exclusion criteria were associate autoimmune thyroiditis not properly treated and celiac disease with poor adherence to diet. All patients were pubertal and underwent clinical examination and measurement of HbA1c and lipid profile. All patients filled-in the KIDMED questionnaire investigating Mediterranean diet quality index and general questionnaire on socio-economic and lifestyle indexes.

The patients were subdivided in 3 TG/HDL-C tertiles according to DiBonito et al. (Diabetes Care 35:158–162, 2012)

RESULTS

	TG-to-HDL-C ratio tertile												
	<1.2			≥1.2 and <2.0			≥2.0			Total			p (K-W)
N	53			23			9			85			
	Mean	SD		Mean	SD		Mean	SD		Mean	SD		
Age	15.28	2.49		16.48	1.86		16.67	2.65		15.75	2.40		0.070
BMIBSDS	0.09	0.95		0.73	0.76		0.16	1.44		0.27	0.99		0.015
SBP (mmHg)	112.17	8.66		116.65	9.82		122.22	10.64		114.45	9.67		0.005
DBP (mmHg)	70.34	7.90		74.35	8.30		77.78	9.72		72.21	8.51		0.016
Wt/Ht ratio	0.87	0.06		0.89	0.05		0.92	0.05		0.88	0.06		0.073
Ins (utotkg)	0.87	0.25		0.90	0.22		0.93	0.11		0.89	0.23		0.562
Chol (mg/dl)	168	29.17		183	34.52		200	42.20		175.66	33.47		0.03
HbA1c (%)	8.10	1.00		8.36	0.97		9.90	1.20		8.36	1.14		0.001
KIDMED	5.60	2.12		5.61	2.15		4.56	2.46		5.49	2.16		0.497
Sport (h/wk)	3.52	4.53		2.59	2.40		2.33	2.18		3.14	3.86		0.750
Seden	3.92	1.97		3.70	1.92		3.89	1.69		3.86	1.91		0.779
Sex	M	F	Total	M	F	Total	M	F	Total	M	F	Total	
N	22	31	53	11	12	23	8	1	9	41	44	85	0.022
	0.42	0.58	1	0.48	0.52	1	0.89	0.11	1	0.48	0.52	1	

Age, number of male patients, BMI SDS, waist-to–height ratio, systolic/diastolic BP and HbA1c significantly increased from the lowest to the highest tertile of the TG/HDL ratio. There were no correlations between the ratio and diet, socioeconomic and lifestyle parameters.

As for the KIDMED questionnaire response 83% of cases was classified as good o medium adherence to diet. As for lifestyle habits 64% of patients spent time in sedentary activities for more than 2 hour/day, while 43/85 patients (51%) spent at least 1 hr/day for sport activities.

A stepwise multinomial logit model identified HbA1c as the parameter with the highest independent influence on belonging to the highest CV risk group (P=0.002), followed by SBP (P=0.034). The role of BMI and waist-to-height ratio disappeared after SBP entered the model.

Conclusion.

In our group of adolescents with T1D showing a fair level of adherence to Mediterranean diet and on average a correct lifestyle, lower HbA1c and male sex were the major determinant of belonging to a low cardiovascular risk group. Achieving or preserve a good metabolic control seems the best way to have a low TG/HDL ratio and therefore a good cardio-metabolic profile.

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