

# Cardiovascular risk factors in adolescents with type 1 diabetes: Prevalance and gender differences



D. VURALLI<sup>1</sup>, L. JALILOVA<sup>2</sup>, A. ALIKASIFOGLU<sup>1</sup>, Z. A. OZON<sup>1</sup>, N. GONC<sup>1</sup>, N. KANDEMIR<sup>1</sup>

1. Division of Pediatric Endocrinology, Department of Pediatrics, Hacettepe University Faculty of Medicine, Ankara, Turkey,

2. Department of Pediatrics, Hacettepe University Faculty of Medicine, Ankara, Turkey

## INTRODUCTION

Obesity may increase the risk of cardiovascular disease (CVD) in patients with type 1 diabetes (T1D). Risk of CVD in girls with T1D is suggested to be higher than boys, however data pertaining to risk of CVD in boys are limited.

## AIM

The aim of this study is to determine the prevalence of obesity and risk factors of CVD in adolescents with T1D as well as the impact of gender on these parameters.

## METHOD

This is a retrospective analysis of 345 cases (190 girls) aged 10-18 years, with T1DM of at least 3 years, using intensive insulin therapy. Patients were divided into lean and overweight/obese groups according to body mass index (BMI). Risk factors for CVD (obesity, dyslipidemia, hypertension) were compared between groups, and impact of gender was also analyzed.

## CONTACT INFORMATION

dvuralli@hotmail.com

## RESULTS

- Prevalence of overweight/obesity was 22.3% which was significantly higher in girls (26.8% vs 16.8%,  $p < 0.001$ ).
- Age, duration of treatment, and HbA1c levels of two groups were similar.
- Daily dose of insulin was higher in overweight/obese group ( $1.4 \pm 0.3$  U/kg vs  $0.9 \pm 0.2$  U/kg,  $p < 0.001$ ).

	Lean (n:268) (77.7%)	Overweight/Obese (n:77) (22.3%)	p value
Gender			<0.001
Girl	139 (73.2%)	51 (26.8%)	
Boy	129 (83.2%)	26 (16.8%)	
Age (yrs)	$16.3 \pm 3.6$	$16.7 \pm 3.4$	0.415
Weight (kg)	$53.8 \pm 14.3$	$76.8 \pm 16.9$	<0.001
Height (cm)	$161.6 \pm 14.8$	$163.9 \pm 16.1$	0.312
BMI	$20.6 \pm 5.1$	$28.1 \pm 4.3$	<0.001
BMI-SDS	$-0.04 \pm 1.00$	$1.5 \pm 0.4$	<0.001
BMI percentile	$43.2 \pm 23.1$	$91.6 \pm 5.7$	<0.001
HbA1c (%)	$8.7 \pm 2.5$	$8.6 \pm 1.5$	0.625
Insulin dose (IU/kg/day)	$0.9 \pm 0.2$	$1.4 \pm 0.3$	<0.001
Duration of treatment (yrs)	$11.3 \pm 3.5$	$11.9 \pm 3.8$	0.353

- Mean TG and LDL levels were highest in overweight/obese girls, followed by overweight/obese boys, lean girls and lean boys, respectively.
- Prevalence of TG and LDL elevation was similar between overweight/obese girls and boys, followed by lean girls and then lean boys.
- Mean HDL levels did not differ among groups.
- Prevalence of low HDL was similar in overweight/obese girls and boys which was higher than lean girls and boys

	Lean Girls (n:139)	Overweight/Obese Girls (n:51)	Lean Boys (n:129)	Overweight/Obese Boys (n:26)	p value
Mean TG (mg/dl)	$105.4 \pm 53.4$	$132.5 \pm 51.4$	$77.1 \pm 34.6$	$121.4 \pm 36.8$	<0.001
Mean LDL (mg/dl)	$112.4 \pm 30.9$	$133.6 \pm 29.6$	$89.1 \pm 21.2$	$121.9 \pm 22.9$	<0.001
Mean HDL (mg/dl)	$61.4 \pm 14.0$	$57.7 \pm 8.7$	$62.0 \pm 12.6$	$54.0 \pm 11.1$	0.630
TG $\geq 150$ mg/dl	13.7% (19/139)	29.4% (15/51)	4.7% (6/129)	23.1% (6/26)	0.009
LDL $\geq 100$ mg/dl	36.7% (51/139)	74.5% (38/51)	23.3% (30/129)	69.2% (18/26)	0.008
HDL $< 40$ mg/dl (Girls $> 16$ years of age $< 50$ mg/dl)	11.6% (16/139)	21.3% (11/51)	6.2% (8/129)	19.2% (5/26)	0.006
Hypertension	5.8% (8/139)	21.3% (11/51)	6.2% (8/129)	15.4% (4/26)	0.003

- Prevalence of hypertension was highest in overweight/obese girls followed by overweight/obese boys, and similar in lean boys and girls

## CONCLUSIONS

Prevalence of obesity in this cohort is higher than the national prevalence of the same age. Overweight/obese girls with T1D have the highest risk for CVD, followed by overweight/obese boys. Even lean girls have higher risk for CVD than lean boys. Control of weight during intensive insulin therapy is crucial in T1D. Special attention should be paid to girls.

## REFERENCES

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