

PREVALENCE OF DYSLIPIDEMIA AND ASSOCIATED FACTORS AMONG OBESE TURKISH CHILDREN



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Introduction: Childhood onset obesity is associated with increased mortality and morbidity related to cardiovascular diseases during adulthood. Dyslipidemia has a fundamental role in the pathogenesis of cardiovascular diseases. This study is designed to evaluate the prevalence and related factors among obese children and adolescent.

Materials and Methods: In this study 823 obese children and adolescent were evaluated retrospectively for dyslipidemia and related factors in our pediatric endocrinology out-patient clinic. Body mass index (BMI) above 95 percentile for Turkish children was defined as obesity. Venous blood samples were drawn from subjects after a 10-h fasting. Dyslipidemia was defined as at least one of these criteria existing; total cholesterol over 200 mg/dl, triglyceride over 150 mg/dl, LDL-C over 130 mg/dl or HDL-C below 40 mg/dl. Insulin resistance was evaluated using HOMA-IR index. HOMA levels over 2,5 for prepubertal subjects and over 4 for pubertal subjects were accepted as insulin resistance. Liver ultrasound findings were interpreted for hepatosteatosis definition.

Table 1. Demographic features of the patients and laboratory findings based on pubertal statement

	Overall	Prepubertal	Pubertal	P
n (%)	823 (100.0)	323 (39,2)	500 (60,8)	
Age (years)	10,8±3,1	7,8±1,9	12,6±2,1	<0,001
BMI SDS	2,5±0,6	2,4±0,6	2,5±0,7	NS
Fasting glucose (mg/dl)	89,2±7,3	88,1±6,4	89,8±7,8	0,001
Fasting insulin (mIU/ml)	12,4±9,1	9,0±5,8	14,6±10,2	< 0,001
HOMA-IR	2,8±2,6	2,0±1,4	3,3±2,7	< 0,001
Insulin resistance n (%)	187 (22,7)	72 (22,3)	115 (23)	NS
Total cholesterol (mg/dl)	172,6±32,7	171,3±31,6	173,6±33,5	NS
Triglyceride (mg/dl)	119,0±62,2	109,3±53,5	125,3±66,6	< 0,001
LDL-C (mg/dl)	100,0±28,3	100,1±26,8	100,0±29,3	NS
HDL-C (mg/dl)	48,5±11,3	49,5±11,6	48,0±11,1	NS
Dyslipidemia prevalence n (%)	353 (42,9)	132 (40,9)	221 (44,2)	NS
Hypercholesterolemia	153 (18,6)	54 (16,7)	99 (19,8)	NS
Hypertriglyceridemia	179 (21,7)	54 (16,7)	125 (25,0)	0,006
High LDL	110 (13,4)	42 (13,0)	68 (13,6)	NS
Low HDL	162 (19,7)	61 (18,9)	101 (20,2)	NS

Conclusion: Prevalence of dyslipidemia is high and hypertriglyceridemia is the most common lipid abnormality in our group. Coexistence of dyslipidemia and hepatosteatosis is more common in pubertal obese patients. Insulin resistance was more severe and abnormal liver function tests were more common in dyslipidemic obese cases with hepatosteatosis. Additionally, higher TSH levels and lower free T4 levels, might be considered that, metabolic and hormonal alterations related with thyroid functions also may be in association with dyslipidemia and hepatic steatosis in obese patients.

Results: Subjects included in the study were aged between 2-18 years (mean 10,8±3,1 years), 55,8% were female and 60,8% were pubertal. Mean BMI and BMI SDS was found 28.3±4.8 kg/m² and 2,4±0,6 respectively. In our study 353 (42,9%) patients met the dyslipidemia criteria; 21,7% of patients had hypertriglyceridemia, 19,7% had low levels of HDL-C, 18,6 % had hypercholesterolemia and 13,7% had high levels of LDL-C There was no statistical difference in the prevalence of dyslipidemia according to sex. Older age and/or high BMI was related with increased prevalence of dyslipidemia. Pubertal obese patients had increased prevalence of hypertriglyceridemia (Table1). Dyslipidemic patients had more hepatosteatosis, insulin resistance and higher levels of ALT and TSH when compared to non-dyslipidemic group (Table 2). Patients with both dyslipidemia and hepatosteatosis had higher levels of ALT, AST and TSH, and lower levels of fT4 (Table 3).

Table 2. Association between dyslipidemia and clinical & laboratory data

	Dyslipidemia (+)	Dyslipidemia (-)	P
Age (year)	11,0±3,0	10,6±3,2	0,049
Gender (F/M)	(186/167)	(273/197)	NS
Puberty (Prep/pubertal)	(132/221)	(191/279)	NS
Fasting insulin (IU/mL)	14,1±11,8	11,1±6,2	< 0,001
HOMA-IR	3,22±3,2	2,47±1,4	< 0,001
Insulin resistance n (%)	102 (28)	85 (18)	< 0,001
ALT (U/L)	24,7±15	21,7±14	0,004
AST (U/L)	24,7±7	24,5±8	NS
Hepatosteatosis n (%)	78 (22)	66 (14)	0,003
TSH (mIU/mL)	2,96±2,4	2,54±1,2	0,001
fT4 (ng/dl)	0,88±0,1	0,89±0,1	NS
Hypothyroidism n (%)	14 (3,9)	12 (2,5)	NS

Table-3 Association between dyslipidemia & hepatosteatosis and laboratory results

	Hepatosteatosis&dyslipidemia (+)	Hepatosteatosis&dyslipidemia (-)	P
n (%)	78 (9,4)	745 (90,5)	
TSH (mIU/mL)	3,3±3,9	2,6±1,4	0,001
fT4 (ng/dl)	0,84±0,14	0,89±0,13	0,001
ALT (U/L)	35,6±22,6	21,7±13,1	< 0,001
AST (U/L)	27,5±11,3	24,3±7,4	0,001