# Plasma Lipid Profile in Obese Children and in Children Hereditarly Predisposed to Coronary Heart Disease

*OBEZ VE HEREDİTER OlARAK KORONER KALP HASTALIĞINA YATKIN ÇOCUKIARDA PLAZMA LİPİT DÜZEYLERİ*

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**SUMMARY**

*In the study plasma trigliseryde, total cholesterol, HL, LDL cholesterol, ApoA andAPo B lipoprotein levels were déterminent in children aqed 7-15 years old and in children hereditarily predisposed to coronary heart disease. In the second group, childrens' father had history of MI before 50 years old.*

*In obese children group 40, and in the other group 20 children were evaluated. For both groups 40, controls were also determined for the same parameters.*

*As a result, in obese and heraditarily predisposing children plasma lipid profiles were different, from controls.*

**KcyWords:** **Plasma Trigliseryde, cholesterol, I IDE. I.DI. cholesterol, Apo Ai and Apo B lipoproteins, coronary heart diseas.**

**ÖZET**

*Bu çalışmada obez 7-15 yaş grubu çocuklarla, babalarında 50 yaş öncesi infarktüs şikayeti olan çocuklarda hipertansiyon ve kan triglişerit, kolesterol, HDL, LDL kolesterol, Apo A \ ve Apo B değerleri araştırılmıştır. Obez çocuk grubunda ideal ağırlığın % 20'sinden fazla kiloya sahip olan 7-15 yaş grubu 40 öğrenci incelenmiştir.*

*50 yaş öncesi infarktüs geçirmiş 20 baba ile 20 çocuğunda aynı parametreler araştırılmış ve normal erişkin ve aynı yaş grubu çocukların kontrol grubu değerleri ile karşılaştırılmışım*

*Sonuç olarak bu parametrelerde obez çocuklarla kontrol grubu, babası infarktüs geçirenlerle kontrol arasında anlamlı farklar belirlenmiştir.*

**Anahtar Kelimeler:** **Pla/ma trigliserid. kolesterol. I1DI.. İDİ. kolesterol, Apo Aı ve Apo B I.ipoprotcinlcr, koroner kalp hastalığı.**

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Autopsies of young servicemen killed in the Korean and Vietnam conflits found coronary artery atherosclcriotic lesions (1,2). This discovery led both epidemiologists and clinicians to question whether atherosclerosis began in childhood. If so, they reasoned then it might be possible to identify high-risk indivaduals for intensive therapy (3).

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In Bogalusa heart study, black boys had heighcr apo A - l levels than white boys (4).

After the first year of life, scrum cholesterol and lipoprotlin levels approximated those of adults (5).

Recently, Stary (6) corfirmcd that early coronary artery lesions can be seen at autopsy in at least 17 % of infants and children less than 5ycars of age.

It has been demonsrated that dys-Iipoproteinemias with elevated levels of Ch of Apo-B containing low density lipoproteins (LDL), and low levels of Ch of Apo A-containing particles of

high density lipoproteins, family history of CHD, are CHD risk factors among adults (7). Some of the other risk factors are obesity, hypertension, high levels of trigliscrydes, low physical work capacity(8).

In the present study, plasma lipid profiles and risk factors were investigated in obese adolsescents and in children hcraditarly predisposed to CHD.

## MATERIAL AND METHODS

Two groups of children were studied for determining the risk factors. The first group comprised 40 obese school children of both sexes at the age range 7-15 from Atatatiirk's University Campus. All the children had similiar socioeconomic level and dietary form. For this group 20 controls were included in with same properties except obesity. The second group (20), was chosen from children whose fathers had premature coronary infarction before 50 years old. Another adult control group (20) were added.

As risk factors obesity, hypertension, family history of CHD, plasma triglyseridcs, total cholesterol, LDLCh, HDLCh, Apoprotein Ai, and B levels were determined.

The criteria for obesity were body weight 20 % higher than ideal and triceps skinfold greater than the 75 th percentile for age and sex. BP s were determined after the children had been resting in a supine position for 20 minutes.

Venous blood samples were taken from a cubital vein, after overnight fasting into vacutainer tubes containing 1.0 g/1 disodium EDTA. Plasma was obtained by low speed centri fugation for 30 min at 4°C. The plasma levels of Ch and triglpycerides were measured on a Hitachi 705 Auto Analyzer, as well as the HDLCh content after preliminary elimination of very low density LP and LDL from plasma with heparin manganese precipitation. The LDLCh level was calculated according to the formula of Fried wald ct al (9).

Plasma concentration of Apo A-I and B were measured with immunoturbidimetric analysis. SPq'IM $_{test\ system}$ (Hitachii 4020 Fotometre-Atab).

The statistical analysis of the results were evaluated by student's t-tcst differences between the mean values.

## RESULTS

Triglyceride values > 100 mg/dl were in 55 %, > 200 mg 12.5 % in obese student's, but 65 % > 100 mg/dl, 20 % > 200 mg in children with family hist, of PCHD group. Triglycerides were higher then 200

**Tablel.** Lipid Profile of Groups

| | | OBFSCH. 14F, 26M | CONTROL GROUPS 10M, 10F | II.P.C.II.D 6F. 14M | P.P.M.I 20 M | ADULT CONTROL 10M |
|---|---|---|---|---|---|---|
| TG | x | 132.2 | 125.1 | 140 | 184. | 192.17 |
| 50-200 | SD | 68.3 | 31.9 | 62.7 | 83.6 | 65.8 |
| mg/dl | | a | a | a | a | |
| K(ChoIest) | x | 195 | 190 | 196.9 | 200.3 | 196.3 |
| 70-120 | SD | 27.9 | 33.3 | 31.2 | 45.3 | 46.4 |
| mg/dl | | a | a | a | a | |
| IIDL | x | 38.1 | 47.7 | 53.3 | 50.8 | 67.2 |
| 35 | SD | 7 | 5.6 | 9.3 | 11.5 | 14.1 |
| mg/dl | | | d | e | a | d |
| LDL | x | 112.6 | 84.4 | 110.3 | 135 | 97.6 |
| 150 | SD | 23.4 | 30.6 | 24.2 | 53 | 53.1 |
| mg/dl | | d | b | a | d | |
| Apo-A | x | 128.7 | 162.6 | 143.6 | 110.7 | 131 |
| 145 ± 2 0 | SD | 21 | 23.8 | 16.7 | 10.8 | 14.9 |
| mg/dl | | d | d | d | d | |
| Apo-B | x | 79.3 | 57.2 | 70.2 | 77.8 | 46.2 |
| 70 ± 1 8 | SD | 12.9 | 18.7 | 14.1 | 27.1 | 26.5 |
| mg/dl | | d | d | d | d | |

*Hereditarly Predisposed to coronary Heart Disease (HPCGD)
•Parent with Premature Myocard Infarction (PPMI)

a = P>0.05
b = P<0.05
c = P<0.01
d = P<0.001

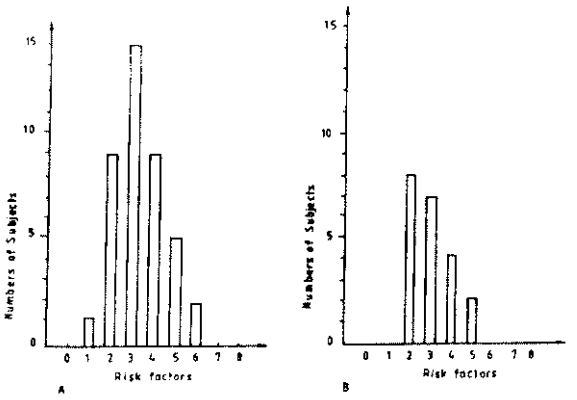


**Figure 1.** Coronar artery disease risk factors obese (A) and having familial history of PCIID (B) children

mg/dl in 10 % of both fathers and children of this second group.

T.Ch values 200 mg/dl were found in 40 % of obese, 50 % of fathers with PCHD, and 15 % of their ch 15 % of obese had LDLCH 150 mg, 15 % of fathers with PCHD, but none of their children.

Apo B levels > 85 mg/dl were found in 27.5 % in obese, 20 % in fathers with PCHD, but none of their children.

Blood perssures were above normal in 45 % of obese, (7 of then had abnormal lipid profile) 15 % of children with fam. hist, of PCHD.

Plasma lipid profile of all groups were shown at table 1. Risk factors were shown at figure 1. In obese group 75 % had three or more risk factors. In the others childrens group 60 % had three or more risk factors.

As shown from tabic 1 plasma HDLCh, LDLCh, Apo Ai and B values were significantly different from control values in obese and f.h of PCHD children.

## DISCUSSION

Obese adolescents have an alarmingly high incidence of multiple coronary heart disease risk (10-13). In the Wilmore(lO), Lauer (11) ve Gilliom et all (14). and Fripp et all (12) studies, approximately 14 %, 4,6 %, 36 %, and 11 % of the adolescents were reported to possess two or more coronary heart disase risk factors, with obesity the most prominent. In the Becqucstudy, 97 % of 36 obese adolescents had four or more risk factors(8).

In our study 75 % of obese children had three or more risk factors for CHD. 45 % of them showed hypertension. Plasma triglvserides and total Ch values were not differed from controls But HDLCh and Apo Al were lower, LDL and Apo B values were higher than controls significantlyl. Becque (8) indicate that changes in blood pressure and other coronary heart disease risk variables are possible with diet and exercise intervention. American Heart ASC. position statement that exercise is an important factor leading to a more efficient cardiovascular system and reducing atherosclerotic risk (15).

Individuals with family history of premature coronary heart disease ar at increased risk of developing CHD (16). Among myocardial survivors with premature CHD and under 60 years of age, about 15 % have some of familial hyperlipoproteinemia, and a much smaller percentage, about 5 % have heterozygous familial hypercholesterolemia (17). About one-third of children of parents suffering myocardial infarction before age of 50 years will be found to have primary dyslipoprotcinemia (16). In Pcrova et al study, the paternal coronay heart disease group, had, compared with the reference group, lower levels of HDL, and Apo Ai, higher levels of LDL Ch, triglycerides and apoprotein B with blood pressure lability (9).

In Svcqcr et all. Study, 14 % of the 84 children with family histories of premature CHD had abnormally high TCh and LDL-Ch concentration and 13 % of parents had abnormal TCh LDL-Ch concentrations. In 6 % of the high risk families abnormal tests were found in both child and parents (18).

In Atılgan et all. study, TCh, and LDLCh concentrations were also significantly higher in children whose parents had premature CHD than controls (19).

In our study 60 % of children with family history of premature CHD had three or more risk factors for CHD, 15 % had hypertension, LDLCh and Apo Ai levels were significantly different from controls. Triglyseridcs were higher than 200 mg/dl in 10 % of both fathers and children.

In conclusion, obese children and children with family history of premature CHD had more risk of atherosclerosis and measures such as diet and exercise must be considered for prevention.

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