

Preliminary results of HDL levels in the Düzce region (Turkey): normal rather than low

Düzce (Türkiye) bölgesinde HDL düzeylerinin ön çalışma sonuçları: Düşük değil normal

Hatice Kurt Yüksel, Abdurrahman Coşkun, Sadık Duran*, Özlem Yavuz

From Departments of Biochemistry and *Cardiology, Düzce School of Medicine, Abant İzzet Baysal University, Düzce, Turkey

Cardiovascular diseases (CVDs) are the foremost leading cause of deaths in the World. In the United States, CVDs are responsible for 38 % of all deaths and 53 % of these are due to coronary heart disease (CHD) (1). Similarly, CHD is the leading cause of death in the Turkish population (42%) (2). Smoking, hypertension, diabetes mellitus, lack of physical exercise and abnormal blood lipid levels are the most important risk factors effecting atherosclerosis development. High levels of low density lipoprotein cholesterol (LDL) accelerate atherosclerosis, whereas high levels of high density lipoprotein cholesterol (HDL) are preventive (3).

Turks have relatively low levels of total cholesterol (TC) (approximately 68% of men and 78% of women have TC levels less than 200 mg/dl) and low levels of LDL (approximately 63% of men and 72% of women have LDL levels less than 130 mg/dl) (4). While evaluating the effect of lipid profiles on CHD, the TC/HDL ratio is considered as a higher risk factor than serum TC levels (5) and this ratio is high in Turkish adults (4). A two unit increase in this ratio causes a 68% increase in the risk of fatal and non-fatal CHD. The TC/HDL ratio of more than 5.5 in men, and 5 in women, are considered as increased risk. In accordance with this ratio, nearly one third of Turkish adults (12 million) are beneath the high risk levels for CHD (5).

The studies which have been carried out at various times and in different parts of Turkey have suggested that the Turkish population has low HDL levels (3 - 6). Furthermore they have suggested that increased hepatic lipase activity was the main cause of low HDL in the Turkish population. The mean hepatic lipase activity was 24% higher in Turkish men and 31% higher in

Turkish women than in non-Turkish men and women (6).

Studies to determine lipid profiles have not covered all areas of Turkey. In this preliminary study we aimed to investigate the lipid profile and especially the HDL levels of the people in the Düzce region.

Overall, 441 Turkish adults (20 years of age or over) who were seen at Abant İzzet Baysal University Düzce School of Medicine Hospital between 01-15 January 2005 were randomly selected and included in the study. Ten ml of blood were drawn from each subject and serum triglyceride, total cholesterol, and the HDL levels were measured by standard clinical chemistry methods using an Olympus AU 640 autoanalyzer (Olympus, Japan). The LDL and VLDL levels were calculated by Friedewald equation using measured triglyceride, total cholesterol and HDL values (7).

The HDL levels obtained were 55.3±11.6 mg/dl in women and 45.8±11.0 mg/dl in men (reference range 35-60 mg/dl). Total cholesterol levels were 204.1±45.0 mg/dl in women and 195.7±46.5 mg/dl in men. The other parameters are shown in Table 1.

In the Turkish Heart Study (1990-1993; including 9000 individuals) the mean HDL levels were reported as 34-38 mg/dl in men and 37-45 mg/dl in women (4), and similarly in the TEKHARF study (1997/98) the mean HDL levels were reported as 37.2 mg/dl in men (n=1211) and 44.9 mg/dl in women (n=1261) (8). In this preliminary study of the Düzce population, we obtained HDL levels 55.3±11.6 mg/dl in women and 45.8±11.04 mg/dl in men. The TC/HDL ratio was 3.7 in women and 4.3 in men. In contrast to previous studies, these data were within the normal reference range.

Table 1. Lipid levels in the Düzce region

	Triglyceride, mg/dl	Total Cholesterol, mg/dl	HDL, mg/dl	LDL, mg/dl	VLDL, mg/dl
Women	143.8±63.1	204.1±45.0	55.3±11.6	120.1±36.9	28.7±12.6
Men	161.1±74.8	195.7±46.5	45.8±11.0	116.1±37.1	33.9±20.1

Values are given as mean ± SD.

HDL- high density lipoprotein cholesterol, LDL- low density lipoprotein cholesterol, VLDL- very low density lipoprotein cholesterol

In conclusion, HDL levels in the Turkish population, especially in some local areas that have not been evaluated in the earlier studies, may not be as low as supposed.

Acknowledgements

We would like to thank: Esra Yamansavcı and Beyza Şen, Students (Class II) of the Düzce School of Medicine for their assistance.

References

1. Heart Disease and stroke statistics - 2005 Update, American Heart Association. Available from: URL: <http://www.americanheart.org> (April 2005)
2. Onat A, Keleş İ, Çetinkaya A, Başar Ö, Yıldırım B, Erer B et al. Prevalence of coronary mortality and morbidity in the Turkish adult risk factor study: 10 year follow-up suggests coronary 'epidemic'. *Türk Kardiyol Dern Araş* 2001; 29: 8-19.
3. Onat A, Risk factors and cardiovascular disease in Turkey. *Atherosclerosis* 2001; 156: 1-10.
4. Mahley RW, Palaoglu EK, Atak Z, Dawson-Pepin J, Langois AM, Cheung V, et al. Turkish Heart Study: lipids, lipoproteins, and apolipoproteins. *J Lipid Res* 1995; 36: 839-59.
5. Onat A. Lipids, Lipoproteins and apolipoproteins among Turks, and impact on coronary heart disease. *Anadolu Kardiyol Derg* 2004; 4: 236-45.
6. Bersot TP, Vega GL, Grundy SM, Palaoglu KE, Atagunduz P, Ozbayrakci S et al. Elevated hepatic lipase activity and low levels of high density lipoprotein in a normotriglyceridemic, nonobese Turkish population. *J Lipid Res* 1999; 40: 432-38.
7. Rifai N, Bachorik PS, Albers JJ. Lipids, lipoproteins, and apolipoproteins. In: Burtis CA, Ashwood ER, editors. *Tietz Textbook of Clinical Chemistry*. Philadelphia: WB Saunders Company; 1999. p. 809-61.
8. Onat A, Yıldırım B, Uslu N, Gürbüz N, Keleş İ, Çetinkaya A. Investigations plasma lipoproteins and apolipoproteins in Turkish adults: overall levels, associations with other risk parameters and HDL's role as a marker of coronary risk in women. *Türk Kardiyol Dern Araş* 1999; 27: 72-9.