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Lipoprotein(a) Levels in Type II Diabetic Patients Are Not Influenced by Metabolic Control or by Microalbuminuria

Lipoprotein(a) [Lp(a)] is a cardiovascular risk factor in the general population, but its role, as such, in diabetic patients has yet to be established. Microalbuminuria is a risk factor for cardiovascular diseases in type II diabetic patients, but the mechanism(s) accounting for this association is as yet, largely unknown. In microalbuminuric type II diabetic patients, the Lp(a) levels have been reported normal (1,2) or increased (3). Conflicting results have been reported about the relation between Lp(a) levels and the degree of metabolic control in type II diabetic patients (4–7).

We examined a group of 71 consecutive type II diabetic patients and a group of 20 (8 men, 12 women) age-matched nondiabetic control subjects to establish whether Lp(a) levels are related to the presence of microalbuminuria (albumin excretion rate [AER] between 20 and 200 μg/min) or to the degree of metabolic control. Diabetic patients without microalbuminuria were 19 men and 28 women; 26 treated with diet only and 21 with diet plus oral agents. Diabetic patients with microalbuminuria were 11 men and 13 women; 9 treated with diet only and 15 with diet plus oral agents. None of the diabetic patients or control subjects was on hormonal or insulin treatment.

Exclusion criteria were antihypertensive treatment with drugs other than angiotensin-converting enzyme inhibitors or calcium antagonists; treatment with β-blockers, diuretics, or hypolipidemic drugs; recent history of vascular events; acute or chronic systemic diseases; and AER >200 μg/min.

Lipoprotein(a) was evaluated by an enzyme-linked immunosorbent assay method (8), HbA_{1c} by high pressure liquid chromatography, and urinary albumin by radioimmunoassay at least three times over a period of a week in 24-h urine collections. Comparisons among groups were performed with the Kruskall-Wallis test of variance, the Mann-Whitney (*U*) test, or the analysis of variance and Student's *t* test when appropriate. Pearson's correlation coefficient was used for correlation analysis. Triglyceride, urinary albumin excretion, and Lp(a) values were logarithmically transformed before inclusion in this analysis.

Lp(a) levels are not significantly different between control subjects (median 13, range 2–59 mg/dl) and diabetic patients with (9, 1–51) or without (12, 2–32) microalbuminuria. Analysis of correlation shows that among diabetic patients, Lp(a) levels are not related to plasma lipid levels, AER GHb, or duration of diabetes.

The frequency distribution of Lp(a) isoforms in diabetic patients is the same as in the nondiabetic population (9). Since serum Lp(a) levels are largely (>90%) genetically determined by Lp(a) isoforms (10), it would seem that in diabetic patients, Lp(a) levels should not differ from those in nondiabetic subjects because of a genetic component.

In our study, Lp(a) levels are not significantly affected by the presence of microalbuminuria and are not related to the degree of metabolic control. Our observations are cross-sectional, and we cannot establish whether modifications of the AER or of the degree of metabolic control may affect Lp(a) levels.

Since high Lp(a) levels are an independent vascular risk factor in the general population, it seems important to establish the role of Lp(a) as a vascular risk factor in diabetic patients and to identify possible relations among Lp(a) levels and microalbuminuria or metabolic control. In type II diabetic patients, microalbuminuria and a poor metabolic control are associated with an increased risk of vascular complications, but from our study, this association does not seem to be mediated by increased Lp(a) levels.

SABINA ZAMBON, MD
GORETTA BALDO-ENZI, PHD
MARIAROSA BAIOCCHI, PHD
ROMANO NOSADINI, MD
ENZO MANZATO, MD
GAETANO CREPALDI, MD

From the Department of Internal Medicine, University of Padua, Padua, Italy.

Address correspondence to Enzo Manzato, MD, Istituto Medicina Interna, via Giustiniani, 2, 35128 Padua, Italy.

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IDDM and Celiac Disease

The letter of Chowdury et al. (1) demonstrated by epidemiological methods that the prevalence of symptomatic celiac disease (CD) in adult insulin-treated patients is much lower than in several studies (2–4), namely, only 0.17%.

Reports on an increased association of insulin-dependent diabetes mellitus (IDDM) and CD come partly from case histories (5–7) and from a few studies from Italy (3), Finland (2), and Sweden (4), finding a prevalence of CD up to 4% in young IDDM patients (most cases being asymptomatic only and found by screening for antigliadin antibodies [AGA]).

There are no accurate estimates of the prevalence of subclinical CD in unselected populations using screening for AGA followed by intestinal biopsy.

All prevalence data on CD are derived only from clinically symptomatic cases, and the prevalence rates, including asymptomatic cases, are probably much higher. Therefore, the comparison between prevalence rates arising from highly sensitive screening procedures for subclinical disease and prevalence rates of clinically symptomatic cases seems to be inappropriate and results in misleading conclusions.

Austria is a country with a high prevalence of CD compared with the western New York area (8). Preliminary results from a collaborative study in Austria show a frequency of 1:1,200 for the period 1983–1987 of CD in the general pediatric population; therefore, in 1985, we tested 164 (90 male, 74 female) diabetic children and adolescents for IgG AGA by red cell immunosorbent fluorescence test (9). Their mean age was 12.1 ± 3.5 years, their manifestation was at 8.3 ± 34 years of age. None of them were previously diagnosed with CD. Eleven patients (8 males, 3 females) had IgG AGA ≥1:32 (mean age 13.5 ± 1.2 years). Only one boy presented with delay in growth and pubertal development. Ten of IgG AGA positive children underwent intestinal biopsy, which was found to be normal in all cases. One girl (15 years old, 1-year duration of IDDM) without clinical symptoms of malabsorption refused to be biopsied.

Assuming a sensitivity of ~100% of the screening test used, the maximal prevalence of CD in our IDDM patient cohort would be only 0.61% even for the asymptomatic subclinical form of CD. The reason for the observed higher prevalence of subclinical CD in other IDDM cohorts, such as in Finland (2) and Sweden (4) with a five times higher rate, remains obscure.

On the other hand, there are well-documented geographical differences in the prevalence of IDDM with an almost five times higher rate in Finland than in Austria (10).

Genetic as well as environmental factors may contribute to these regional differences in the occurrence of IDDM and the prevalence of subclinical CD in IDDM.

In accordance with Chowdury et al. (1), we believe that CD in young IDDM patients is a rare occasion and that failure to thrive or insufficient metabolic control far more often is the consequence of inadequate treatment of IDDM with insulin or diet.

EDITH SCHOBER
GERHARD GRANDITSCH

From the University Children's Hospital, Vienna, Austria.

Address correspondence to Edith Schober, University Children's Hospital, Währinger Gürtel 18–20, A-1090, Vienna, Austria.

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