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Lipoprotein(a) Levels in Japanese Children With IDDM

High levels of Lp(a) have been proposed as one of the risk factors for CHD. It has been shown by some that diabetic subjects have higher levels of Lp(a) and that there might be a genetic difference in mean levels and response of Lp(a) to hyperglycemia (1,2). We evaluated blood concentrations of Lp(a) and correlations with glycemic control in Japanese children with IDDM.

The study included 31 patients (17 boys and 14 girls) with IDDM and 19 normal control subjects (12 boys and 7 girls). Mean ± SE ages were 14.1 ± 1.1 and 15.9 ± 1.1 yr, respectively. Four girls in each group had begun menstruation. Patients with obesity (obesity index >20%), short stature (SD score < −2 SD), familial history of hyperlipidemia, or hypothyroidism (free T_4 <0.8 ng/dl) were omitted from this study. The patients were divided into well-controlled (HbA_{1c} < 8%, n = 15) and poorly controlled groups (HbA_{1c} ≥8%, n = 16). The duration of diabetes, insulin dose, and age were not different between the two groups of IDDM patients. No patient had continuous microalbuminuria. Blood samples were obtained before the morning insulin injection. The concentrations of serum Lp(a), serum fructosamine, and HbA_{1c} were measured by a highly specific enzyme-linked sandwich immunoassay (3), high-performance liquid chromatography, and enzymatic assay, respectively. Statistical analyses were performed by regression analysis and Mann-Whitney U test. Data are means ± SE.

HbA_{1c} and fructosamine levels in the poorly controlled group, well-controlled group, and control subjects were 9.1 ± 0.3% and 497.6 ± 16.9 μM, 7.1 ± 0.1% and 414.9 ± 9.6 μM and, 4.6 ± 0.1% and 259.5 ± 3.8 μM, respectively. Both levels were significantly higher in the poorly controlled group than in other groups ($P < 0.01$). The levels of Lp(a) in the poorly controlled group (24.6 ± 1.6 mg/dl) were significantly higher than those in the well-controlled group and control subjects (15.5 ± 1.2 and 13.2 ± 0.6 mg/dl, respectively, $P < 0.01$). In diabetic patients, Lp(a) levels showed a positive correlation with the levels of HbA_{1c} ($r = 0.69$, $P < 0.01$) and fructosamine ($r = 0.46$, $P < 0.01$). No correlation could be found between the levels of Lp(a) and blood glucose.

The mean levels of LP(a) in the control subjects were higher than reported values in black or white populations (1,2). The levels of Lp(a) were higher in the poorly controlled diabetic patients. Although an explanation for high levels of Lp(a) in poorly controlled diabetic children has yet to be fully established, some have reported that the high levels of Lp(a) in diabetic subjects decline with improved glycemic control (4,5). In this study, a significant correlation was noted between the levels of Lp(a) and HbA_{1c} or fructosamine. These data indicate that glycemic control may have an effect on the levels of Lp(a) in Japanese children with IDDM. If elevated Lp(a), attributable to hyperglycemia, is a risk factor for early CHD in diabetic subjects, strict glycemic control may be essential. From previous reports and our data, we propose that blood levels of Lp(a) should be evaluated in the management of diabetic patients.

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Lp(a), LIPOPROTEIN(a); IDDM, INSULIN-DEPENDENT DIABETES MELLITUS; CHD, CORONARY HEART DISEASE.

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