COMMENTS AND RESPONSES

Total and High–Molecular Weight Adiponectin in Relation to Metabolic Variables at Baseline and in Response to an Exercise Treatment Program: Comparative Evaluation of Three Assays

Response to Blüher et al.

Recently, increasing attention has been paid to the relationship between multimeric forms of adiponectin and metabolic variables to assess the metabolic significance of high–molecular weight (HMW) adiponectin. Blüher et al. (1) investigated associations between total adiponectin and HMW with insulin resistance and the metabolic syndrome. The study did not demonstrate the superiority of HMW over total adiponectin in assessing insulin sensitivity that was previously reported in larger groups (2,3).

We studied 328 Caucasian men and women (114 non–insulin-resistant, 101 insulin-resistant, and 113 type 2 diabetic patients). Adiponectin concentrations were detected using the enzyme-linked immunosorbent assay, described by Blüher et al. (ALPCO Diagnostics, Salem, NH). Total and HMW adiponectin showed significant negative correlations with the metabolic syndrome ($r = -0.31$ and -0.45, respectively) and homeostasis model assessment of insulin resistance ($r = -0.15$ and -0.23, respectively). Receiver operating characteristic curves were calculated to discriminate between subjects with ($n = 144$) and without ($n = 184$) the metabolic syndrome, as defined by the International Diabetes Federation criteria. The area under the curve for HMW adiponectin was significantly larger than that for total adiponectin (HMW 0.763 [95% CI 0.711–0.814] vs. total 0.679 [0.621–0.737] adiponectin, $P = 0.015$). With respect to identification of insulin resistance (defined by homeostasis model assessment of insulin resistance >2.5, excluding patients treated with insulin), HMW adiponectin predicted this condition better than total adiponectin. Again, the area under the curve for HMW adiponectin was significantly larger than that for total adiponectin (HMW 0.832 [95% CI 0.771–0.892] vs. total 0.692 [0.612–0.791] adiponectin, $P = 0.002$).

The data presented here and in previous clinical studies (2,3) clearly show superiority of HMW adiponectin over total adiponectin in predicting the metabolic syndrome trait cluster. In addition, Lara-Castro et al. (2) found significant correlations of adiponectin particle size, with insulin sensitivity detected in clamp studies. These clinical and experimental data are in contrast to the data presented by Blüher et al. that do not show any associations between HMW adiponectin and markers of the metabolic syndrome. Associations were previously reported in large independent cohorts, with HDL presenting particularly strong correlation coefficients (2,3). In our study, HMW adiponection accounted for 37.7% of HDL variation. Hence, potential confounders, such as current medication (e.g., fibrates or thiazolidinediones known to affect adiponectin levels) or technical limitations may have influenced the data reported by Blüher et al. Prospective clinical studies will be needed to clarify the role of HMW and total adiponectin for the prediction of clinical end points associated with the metabolic syndrome.

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