Obesity Is a Major Determinant of the Association of C-Reactive Protein Levels with the Number of Metabolic Syndrome Components in Type 2 Diabetes

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C-reactive protein (CRP), a marker of systemic inflammation, is associated with long term CV morbidity in patients with type 2 diabetes (T2DM) and in non-diabetic patients with the metabolic syndrome (MS). Elevated CRP has been found in non-diabetic obese subjects. To determine the contribution of body adiposity and glucose control to CRP levels in recently diagnosed (≤3yrs), drug-naive, T2DM patients (FPG ≤10mmol/L), we examined a random, representative subgroup (n=903) of the US cohort in ADOPT [A Diabetes Outcome Progression Trial]. The relationship between baseline variables, NCEP ATPIII MS phenotype and hsCRP levels was explored.

Geometric mean hsCRP significantly increased with increasing numbers of MS components based on a test for linear trend ($p<0.0001$; Table). Similarly, BMI ($p<0.0001$) and HbA_{1c} ($p=0.0004$) increased with increasing numbers of MS components. Adjustment of CRP levels for body adiposity abolished the association between CRP and the number of MS components ($p=0.237$; Table), whereas adjustment for HbA_{1c} maintained the association ($p<0.0001$).

	# NCEP MS Components				
(N)	1 (30)	2 (94)	3 (219)	4 (332)	5 (228)
hsCRP*; mg/dl†	0.17 (0.11, 0.25)	0.24 (0.19, 0.30)	0.36 (0.31, 0.42)	0.40 (0.36,0.45)	0.47 (0.41, 0.54)
BMI**, kg/m²†	25.5 (23.8, 27.1)	29.3 (28.3, 30.3)	33.1 (32.5, 33.8)	34.3 (33.8, 34.9)	36.1 (35.5, 36.7)
BMI-Adjusted CRP*; mg/dl†	0.32 (0.23, 0.47)	0.34 (0.28, 0.42)	0.38 (0.33, 0.43)	0.38 (0.34, 0.42)	0.39 (0.35, 0.45)

*Geometric Mean, **Mean, †(95% CI)

We conclude that CRP, a marker of systemic inflammation, is strongly related to the number of MS components; however, in recently diagnosed, drug-naive T2DM patients this relationship is determined by body adiposity not by glucose control.