ADIPOCYTE FATTY ACID-BINDING PROTEIN: A PREDICTIVE MARKER OF METABOLIC SYNDROME

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Background

Adipocyte fatty acid-binding protein (A-FABP) is a major cytoplasmic protein abundantly expressed in mature adipocytes and activated macrophages. A-FABP binds fatty acids with high affinity and functions in intracellular fatty acid trafficking, regulation of lipid metabolism, and modulation of gene expression. Emerging evidence suggests that A-FABP is closely associated with obesity, diabetes mellitus, and dyslipidemia.

We have previously demonstrated that circulating A-FABP concentrations are significantly higher in overweight/obese than in lean individuals. Age- and sex-adjusted serum A-FABP concentrations correlate positively with waist circumference, blood pressure, dyslipidemia and fasting insulin.


T he invention relates to a method for determining the concentration of A-FABP protein for diagnostic and research of the metabolic syndrome, of non-obese and non-diabetic individuals.

In a 10-year follow-up study, the plasma A-FABP levels was found to be a STRONG PREDICTOR of type 2 diabetes independently of the traditional risk factors including obesity, insulin resistance, or glycemic index. Ref

Clinical study A

The study enrolled 486 individuals, of which 100 were healthy individuals, 100 patients with dyslipidemia without another criteria of metabolic syndrome, 86 patients with diabetes mellitus, type 2, 100 obese individuals, and 100 patients with metabolic syndrome.

Clinical study B

Among 376 Chinese subjects who did not have the metabolic syndrome at baseline, 50 had developed metabolic syndrome at 5-year follow-up, and A-FABP was the only INDEPENDENT PREDICTOR OF DEVELOPMENT OF METABOLIC SYNDROME during the study. A-FABP was predictive of metabolic syndrome even after adjustment for each of its individual components. Thus, circulating A-FABP predicts development of metabolic syndrome independently of adiposity and insulin resistance. The baseline A-FABP concentration was significantly higher in subjects who progressed to the metabolic syndrome at year 5: 19.9 ng/mL (interquartile range, 16.7 to 26.2 ng/mL) versus 15.0 ng/mL (interquartile range, 10.3 to 22.2 ng/mL) in subjects without the metabolic syndrome (p=0.0002).

Clinical study C

In multiple stepwise logistic regression analysis, baseline A-FABP (P<0.001) and HOME-IR (P<0.001) were the only independent predictors for the development of the metabolic syndrome at year 5.

Clinical study D

Degenerative aortic valve disease shares many features with atherosclerosis. The initial plaque of aortic stenosis is similar to that seen in coronary artery disease. A significant proportion of patients with severe aortic stenosis have no coronary atherosclerosis; therefore, the study was designed to survey the risk in such individuals, and enrolled two groups assessed by coronary angiography:

- group 1 (N= 64) - patients with AoS and without coronary artery disease (CAD)
- group 2 (N= 42) - control group; patients without AoS and CAD

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Conclusion

Given the data mentioned above, the BioVendor Human Adipocyte FABP ELISA (IVD, CE-marked) is thought to be an efficient tool for prediction of diabetes mellitus, metabolic syndrome in relation to cardiovascular morbidity and mortality.

References