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*Editorial Comment*

## Metabolic syndrome: no internationally defined standard cut-off value for waist circumference

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The metabolic syndrome (MS) is a cluster of interrelated risk factors of metabolic origin – metabolic risk factors that appear to directly promote the development of atherosclerotic cardiovascular disease and increase the risk of development of type 2 diabetes.<sup>1</sup> In addition to diabetes, these patients with MS have increased incidence of elevated plasma triglycerides, lower high density lipoproteins (HDL), and higher blood pressure. The association with MS has now been expanded to include small dense, low density lipoprotein (LDL), abdominal/truncal obesity, prothrombotic states with increased levels of plasminogen activator inhibitor type 1 (PAI-1), microalbuminuria, impaired fasting glucose (insulin resistance syndrome) and proinflammatory states. Although there is no agreement on a universal definition of MS, insulin resistance, impaired fasting glucose or diabetes constitute major criteria for this definition.<sup>2</sup>

However, it is still debatable whether or not these components constitute a cluster of associated risk factors or a composite that can be classified as a syndrome. It has been suggested that this aggregation results from a genetic defect that produces insulin resistance aggravated by obesity. Even there is full agreement on an association of these risk factors, the mechanism and their intertwined relationship remains speculative and open to further investigation. An example is the case of hypertension caused by hyperinsulinism secondary to insulin resistance. In reality, the patients with hyperinsulinism resulting from an insulinoma are generally normotensive and there is no normalization of blood pressure after surgical resection of the insulinoma restoring normal serum insulin levels.

An alternative unifying hypothesis could be that visceral obesity directly induces the other components of MS and serves as an independent risk factor for all the other components of MS. In addition to the metabolic effects of visceral obesity, adipocytes produce a number of products or hormones including tumor necrosis factor- alpha, leptin, adiponectin and resistin. Even the comprehensive under-

standing of the roles of these substances is still lacking, clearly the adipocytes are not innocent bystanders. They play an active role in the development of systemic insulin resistance, hypertension and hyperlipidemia.

Several other factors further exacerbate MS: Physical inactivity, advanced age, endocrine dysfunction and genetic aberrations bearing on individual risk factors. The prevalence of MS worldwide seemed to be driven by obesity, the precursor of which is sedentary lifestyle. It must be kept in mind that the diseases that complicate obesity are themselves complex and that their contribution to increased risks for morbidity and mortality extends beyond measurements of body weights or fat distribution.<sup>3</sup>

In this March 2007 issue of the *Journal of Geriatric Cardiology*, Lu et al., while exploiting the ROC (Receiver Operating Characteristic Curve) and Youden index have been able to prove the important link in the hypothetical explanation of a cause and effect relationship between the cluster of risk factors and the development of MS. The most important caveat in this study is the proof of *ethnically appropriate* cut off value for waist circumference. This is a strong testimony as to why it is not appropriate to have an internationally defined standard cut-off value for waist circumference, an important index of obesity and an indirect measure of visceral adiposity. The conformity of the study to IDF criteria is proof that it is accurate for predicting metabolic abnormalities in this population.

We have to remember that the main value of grouping these disorders together regardless of etiologies into MS is to remind the individual physicians that the therapeutic goals are not only to correct hyperglycemia but also to manage the elevated blood pressure and hyperlipidemia that results in cardiovascular morbidity and mortality. Risk reduction is the cardinal principle of management, the presence of MS calls for more extensive short-term risk assessment. The primary intervention is lifestyle modification particularly weight reduction and increased exercise. More aggressive drug

therapy is indicated for those subjects in whom lifestyle changes do not suffice. Drug therapies should be based on global risk assessment and follow current treatment guidelines with emphasis on compelling indications for use of certain classes of drugs based on objective scientific evidences.<sup>4</sup>

This is the most valuable message of Lu et al. and they should be commended for this important contribution in the war against cardiovascular disease in the early part of the 21st century.

#### References

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