Metabolic Syndrome Identification and Treatment

KATHY BERRA

From Stanford Prevention Research Center, Standfore University School of Medicine, California, USA

Metabolic syndrome (MS) [also known as Syndrome X – Insulin Resistance Syndrome – Dysmetabolic Syndrome – Multiple Metabolic Syndrome – The Deadly Quartet – and Cardiometabolic Risk] defines a clustering of cardiovascular risk factors associated with an increased risk of developing Type 2 Diabetes and cardiovascular disease (CVD). These risk factors include: glucose intolerance, dyslipidemia (especially high triglycerides and low HDL cholesterol, small dense LDL, postprandial lipemia and remnant lipoproteins), hypertension, obesity, and increased waist circumference. Other abnormal pathophysiologic processes often accompany MS such as endothelial dysfunction, a prothrombotic state, and increased and levels of inflammatory markers.

Although the term MS is commonly used, the underlying pathophysiology is a condition called "*Insulin Resistance*" (IR). Not everyone with MS is *insulin resistant*. However, IR is significantly more common in persons with MS. One's susceptibility to become *insulin resistant* is influenced by genetics and lifestyle. Two major lifestyle risk factors for the development of IR are increased weight and decreased physical activity levels.

Researchers are looking for ways to more easily identify those persons with the MS risk factors who are *insulin resistant*. An important finding by McLaughlin and colleagues was the association between TG/HDL-C ratio and the presence of IR. Their studies indicate that a ratio of $\geq$3 TG/HDL-C (in persons with a BMI $\geq$25 and TG >130 mg/dL) is predictive of insulin resistance. In pre-menopausal women this ration is >1.5.

Address for reprints: Ms. Kathy Berra
Stanford Prevention Research Center, Stanford University School of Medicine, 211 Quarry Road, Stanford, California 94305, USA

Received October 19, 2008; accepted October 29, 2008

Treatment for MS and IR is multifactorial and is based on key therapeutic lifestyle changes. Improving and maximizing regular aerobic exercise, reaching ideal body weight, and smoking cessation will significantly improve insulin sensitivity thus reducing IR and it's associated negative metabolic processes. A heart healthy diet designed to lower calories, triglycerides, and saturated fat is an additional key component of treating persons with MS and IR. Making these lifestyle changes is critical in preventing the onset of Type 2 Diabetes and cardiovascular diseases. In addition to therapeutic lifestyle changes, medical therapies such as statins, fibrates, niacin, aspirin, hypoglycemics, anti-hypertensives (including Angiotensin Converting Enzyme Inhibitors for persons with renal disease) are recommended for the treatment of associated cardiovascular risk factors. It is important to remember that persons with *insulin resistance* but without CVD who develop Type 2 Diabetes are considered to be at an equivalent risk for a cardiac event when compared to persons with CVD.

Our challenge is to prevent the development of this constellation of well know risk factors for the *Metabolic Syndrome* and *Insulin Resistance* through early therapeutic lifestyle change and cardiovascular risk factor management.

Furture Readings

1. Reaven G. The metabolic syndrome or the insulin resistance syndrome? Different names, different concepts, and different goals. Endocrinol Metab Clin N Am 2004;33:283-303.
2. Grundy SM, Cleeman JI, Daniels SR, et. al. Diagnosis and management of the metabolic syndrome: an American Heart Association/National Heart, Lung, and Blood Institute Scientific Statement. Circulation 2005;112:2735-52.
3. McLaughlin T, Abbasi F, Cheal K, et al. Use of metabolic markers to identify overweight individuals who are insulin resistant. Ann Intern Med 2003;139:802-9.
4. ACE Task Force on the Insulin Resistance Syndrome. Endocrine Practice 2003;9(suppl 2):9-21.