Editorial

Metabolic syndrome and its management

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In broad terms, 'metabolic syndrome' refers to a cluster of atherogenic risk factors that increase the risk of cardiovascular disease. This cluster of factors includes obesity, hypertension, hypertriglyceridemia, low high-density lipoprotein cholesterol concentrations, and hyperglycemia. Despite agreement on the broad definition of metabolic syndrome, the clinical criteria that specifically define the syndrome differ between organizations. These different criteria for definition are discussed in this issue of *Heart and Metabolism*, in articles by Boehm and Scheikofer and by van Zwieten and Visser. Because of the major impact of metabolic syndrome on the risk of developing heart disease and stroke, considerable interest has focused on its treatment. For the most part, recommendations for treatment have focused on modifying the individual components of the syndrome. Specifically, this involves the treatment of hyperglycemia, obesity, hypertension, and dyslipidemia. The article by van Zwieten and Visser provides a concise overview of the drug therapies currently available to treat this syndrome. These pharmacotherapies should be used in conjunction with therapeutic lifestyle modification and preventative measures, to lessen the impact of metabolic syndrome on cardiovascular disease.

Given the major impact that metabolic syndrome has on the risk of cardiovascular disease, a significant research effort is focusing on the effects of the syndrome on organ physiology, and on a better understanding of how patients with the syndrome might be effectively treated clinically. One particularly important area that has received recent research attention has focused on the alterations in fatty acid metabolism that occur in metabolic syndrome. The accumulation of fatty acids within non adipose tissue, such as muscle, can have a number of deleterious consequences on the function of the tissue concerned. Excessive supply of fatty acids to heart and skeletal muscle can lead to the accumulation of fatty acids within these muscles – a condition termed 'lipotoxicity'. The basic science paper by Peura and Schaffer describes how these lipotoxic changes can have an impact on muscle function, including the development of insulin resistance and the development of skeletal and cardiac muscle myopathies. Because abnormalities in lipid metabolism can have a significant impact on heart function, a better understanding of cardiac energy metabolism in metabolic syndrome is desirable. In this issue of *Heart and Metabolism*, the use of positron emission tomography to characterize myocardial metabolism in diabetes, hypertension, and hyperlipidemia is described. This noninvasive approach to imaging cardiac metabolism should not only provide a better understanding of the metabolic changes that occur in the metabolic syndrome, but also be a useful tool to help define novel therapeutic approaches to treatment of the syndrome. One such therapeutic approach may involve the use of trimetazidine, an inhibitor of fatty acid oxidation. A paper in this issue by Fragasso and colleagues provides intriguing evidence, not only that trimetazidine may improve glucose metabolism in diabetic patients, but also that it may improve endothelial cell function. These combined actions suggest a possible use of trimetazidine in the treatment of the hyperglycemic and hypertensive components of metabolic syndrome, although further studies are needed to confirm this.

Metabolic syndrome is a major risk factor for the development of cardiovascular disease. Optimal treatment of the syndrome is therefore essential. Emerging evidence has identified abnormalities in fatty acid metabolism as important contributors to abnormalities of cardiac and skeletal muscle function in metabolic syndrome. Therapeutic management of these abnormalities in fatty acid meta-bolism may present clinicians with one further weapon with which to fight the problem of metabolic syndrome.