Metabolic Syndrome : Concept and Controversies

Prof. Praveen Sharma
Department of Biochemistry
AIIMS, Jodhpur

The prevalence of the metabolic syndrome is increasing in developed and developing Countries. Metabolic syndrome (MetS) is constellation of disturbances including glucose intolerance, central obesity, hypertension and dyslipidemia (hypertriglyceridemia, elevated non-esterified fatty acids and decreased high density lipoprotein cholesterol) present in several forms, depending upon the combination of the different components of the syndrome. It is well accepted that the metabolic syndrome increases the risk for the development of cardiovascular disease, type 2 diabetes, stroke and cancer. It is a matter of debate about the causes for the onset of the metabolic disturbances that constitute the syndrome and there have been several attempts to define it with special attention to one or another component. The American Association of Endocrinology does not consider obesity as a component and highlights the importance of insulin resistance to the syndrome. The initial definition of the World Health Organization also considered insulin resistance as an important feature of the metabolic syndrome, while National Cholesterol Education Program: Adult Treatment Panel III definition gives equal weight to any of the components of the syndrome: fasting blood glucose, glucose intolerance, obesity (measured as waist circumference), hypertension and dyslipidemia. More recently the International Diabetic Federation (IDF) provided worldwide definition for use in clinical practice, considers central obesity and insulin resistance as important causative factors. The IDF consensus group has further highlighted a number of other parameters including pro-inflammatory state that appear to be related to the metabolic syndrome, with the aim to determine the predictive power of these extra criteria for CVD and/or diabetes.The mechanisms that contribute to the pathogenesis of metabolic syndrome (MetS) remain under intense investigation. The understanding of underlying mechanism may help design novel therapeutic strategies. A number of suggested potential mechanisms contributing to the pathogenesis of MetS include fetal programming, dyshomeostasis of the stress system, and the development of a proinflammatory and prothrombotic state as a result of cytokine production and/or dysregulation from the excessive adipose tissue. Delineation of the role of these factors along with the established ones and others that are currently being studied may help clarify the exact pathogenesis of the syndrome and may expand the clinical criteria of MetS. This is of prime importance as there is still a need to develop uniform criteria that can be used by different clinical and research groups, enabling comparisons between study results, in the hope to better predictor the risk, for CVD and DMT2. Any risk factor requires attention, including lifestyle change and/or medications. Aggressive treatment of all major CVD risk factors, including the components of the metabolic syndrome, is critical for the health of the world's population. In this direction, more studies investigating the relation of waist circumference thresholds to metabolic risk and cardiovascular outcomes in different populations are invigorated. However, until this aim is achieved, the consensus definition incorporating IDF and AHA/ NHLBI is suitable for practical use in clinical

medicine. Adoption of these criteria seem to incorporate the most important aspects of the syndrome, recognizing that the risk associated with a particular waist measurement will differ in different populations, albeit with the limitations that it has when applied to mixed ethnicities. Finally, the application of the MetS model has not been fully validated in children and adolescents as yet, suggesting that prevention and treatment in childhood and adolescence should better focus on established risk factors rather than the diagnosis of MetS.
