Report

Appropriate Definition of Metabolic Syndrome among Iranian Adults: Report of the Iranian National Committee of Obesity

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A complex accumulation of metabolic abnormalities including hyperinsulinism, impaired glucose tolerance, hypertension, low HDL cholesterol and hypertriglyceridemia were named syndrome X by Raven, two decades ago.[1] These non-communicable risk factors, which were later termed "metabolic syndrome" have an obscure etiology and a variety of clinical presentations. Therefore, the definition of metabolic syndrome has not been proposed on the basics of etiology and pathology, but has been defined with respect to phenotype. Various definitions of metabolic syndrome have been proclaimed by the World Health Organization,[2] Adult Treatment Panel (ATP) III,[3] International Diabetes Federation (IDF),[4] American Heart Association (AHA), and National Health Lung and Blood Institute (NHLBI).[5] The AHA-NHLBI proposal was a revised definition of ATP III with a reduction in fasting serum glucose from 110 to ≥100 mg/dL. Ethnic-specific values for waist circumference have been proposed for some populations, e.g. Europids and South-Americans.[4] The IDF definition stated that instead of using a universal definition for central obesity, the ethnic-specific waist cut-off values should be considered when defining metabolic syndrome.

It has been reported that the prevalence of metabolic syndrome in the Islamic Republic of Iran is one of the highest worldwide. In the adult population of the Tehran Lipid and Glucose Study (TLGS), metabolic syndrome was found in 42% of women and 24% of men with a total age-standardized prevalence of 33.7%.[6] The prevalence increased by age, from 10% in individuals 20 – 29 years of age to 60% in the 60 – 69 year age group. Moreover, the age-adjusted incidence of metabolic syndrome (defined by the ATP III definition) was found to be 20.4% (95%CI, 19.6 – 21.2) in the TLGS adults (18.4% male vs. 23.1% women) after three years of follow-up.[7]

The prevalence of metabolic syndrome has been reported to be 23% in Zanjan Province.[8] A 2007 national survey of metabolic syndrome showed an age standardized prevalence of 34.7%, based on ATP III, 37.4% based on IDF and 41.6%, based on the ATP III/AHA/NHLBI definitions. The prevalence of metabolic syndrome was higher in women than men, and in urban residents compared to rural populations.[9] Also, in the TLGS population the prevalence of metabolic syndrome (95%CI) was 32.1% (31.2 – 33.0) by the IDF definition and 18.4% (17.6 –19.2) according to the WHO definition; it would be

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Table 1. Criteria for clinical diagnosis of metabolic syndrome in Iranian adults

Measure	Categorical cut-off points
Elevated waist circumference	95 cm (men and women)
Elevated triglycerides or drug treatment for elevated triglycerides	150 mg/dL (1.7 mmol/L)
Reduced HDL-C or drug treatment for reduced HDL-C	40 mg/dL (1.0 mmol/L) in males; 50 mg/dL (1.3 mmol/L) in females
Elevated blood pressure or antihypertensive drug treatment in a patient with a history of hypertension	Systolic 130 and/or diastolic 85 mm Hg
Elevated fasting glucose or drug treatment of elevated glucose	100 mg/dL

of note that the IDF definition has shown good concordance with the ATP III definition and a low concordance with the WHO definition in this study.[10]

In September 2009, the Iranian Ministry of Health and Medical Education in collaboration with the Research Institute of Endocrine Sciences established the National Iranian Committee of Obesity which included endocrinologists, biostatisticians, cardiologists, pediatricians, epidemiologists, nutritionists and officials from the Iranian Center for Noncommunicable Disease Control. The committee reviewed evidence-based studies on indices of central obesity in Iran. The cross-sectional studies reported waist circumference cut-off values with which to diagnose at least two other components of the cardiovascular disease (CVD) risk factors of IDF metabolic syndrome. The waist circumference cut-off values were 84 – 95 cm in women and 86 – 92 cm in men within various age groups[11] and 89 cm for men and 91 cm for women of all ages.[9] The third national survey found a cut-off of 90 cm for waist circumference with which to diagnose metabolic syndrome in both genders.[12] The only prospective outcome-based cohort study in Iran found an identical waist circumference cut-off value of 94.5 cm for both men and women that could predict the incidence of CVD.[13] Based on the above-mentioned evidence, the Iranian National Committee of Obesity announced equal waist circumference cut-offs of ≥90 cm in both genders at risk for CVD risk factors, and that of ≥95 cm in both genders to be at high risk CVD events requiring immediate preventive measures.[14]

A recent joint scientific statement of IDF, NHLBI, AHA, World Heart Federation, International Atherosclerosis Society and the International Association for the Study of Obesity harmonized the definition of metabolic syndrome. It suggested that none of components are obligatory for metabolic syndrome, however three out of five components would qualify a person for metabolic syndrome. It confirmed that waist circumference would continue to be a useful preliminary screening tool and should have national or regional cut-off points. For the remaining four components, a single set of cut-off points previously defined by all associations was suggested.[15]

The Iranian National Committee of Obesity considered the identical cut point of waist circumference for both genders in Iran[14] as well as the above-mentioned new harmonizing definition of metabolic syndrome,[15] and proposed a unified clinical and epidemiological study of metabolic syndrome among Iranians (Table 1).

In conclusion, there is rapid growth of the prevalence of obesity[16] and metabolic syndrome[17] in Iran; thus, having a uniform and harmonized definition for waist circumference and metabolic syndrome should make clinical and epidemiological investigations comparable and more appropriate for trend studies.

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