Metabolic Syndrome — Emerging Clusters of the Indian Phenotype

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Some 250 years ago, JB Morgagni with the help of only a knife for anatomical dissection, an acute mind, and an observational skillfulness was able to identify the intra-abdominal and mediastinal fat accumulation in android obesity.1 He clearly described the association between visceral obesity, hypertension, hyperuricemia, atherosclerosis and obstructive sleep apnea syndrome, long before the modern recognition of this syndrome. The concept of insulin resistance is more than 250 years old and was first described in the 20th century by Himsworth, when in Lancet he wrote about subdivision of diabetes into insulin sensitive and insulin resistance in 1936. Yet it needed Prof. Gerald Raeven who delivered the famous Banting Oration in 1988 to introduce the concept of Insulin Resistance. Several terms are used for the same entity namely, Insulin Resistance Syndrome, Reaven’s Syndrome, Metabolic Syndrome, Deadly Quartet, CHAOS, New World Syndrome, Civilization Syndrome, Syndrome ‘X’ etc. The latest term used is ‘Metabolic Syndrome’ as per ATP III and WHO.2

Metabolic Syndrome is now being increasingly recognized as an emerging threat which will invade desktops of public health policy planners in the decades to come. The clusters which make this syndrome and its etiopathogenesis will keep getting varied in different ethnic populations, regions and countries. Factors like migration, socioeconomic status, lifestyle, nutrition habits play important role. Therefore research in Metabolic Syndrome provides an interdisciplinary forum to explore the pathophysiology, recognition, and treatment of the cluster of conditions associated with the evolving entity of metabolic syndrome. These include but are not limited to: central obesity, endothelial dysfunction, insulin resistance, dyslipidemia, glucose intolerance, type 2 diabetes, prethrombosis and pro-inflammatory states, hyperinsulinemia, hyperuricemia, hypertension, cardiovascular disease, and polycystic ovarian syndrome (PCOS). The individual conditions are only parts of a more generalized problem that requires more than simply correcting a single lab value. For a majority of those affected, inappropriate or poor or defective nutritional status and lack of physical activity are the root causes in the disease process.

Metabolic syndrome is estimated to affect more than one in five adults, and its prevalence is growing in the adult and pediatric populations. Metabolic Syndrome and Related Disorders will be pertinent to the practice of the general physician as well as the endocrinologist, the cardiologist, the diabetologist and other specialists. Metabolic Syndrome always lacked a structure and has different facets seen by different specialists. Diabetologists see it as insulin resistance, cardiologists see it as dyslipidemia and syndrome X, it is polycystic ovarian syndrome for the adolescent physicians and ob-gyn specialists. However both auxological/anthropometric variables as well as lipid levels need more Asian Indian validation. Each component of cluster has variations based on several factors including migration status, socio-economic class, rural-urban subclass etc. The body fat pattern and lipids are particularly making the Asian Indians coronary prone. Unfortunately the Asian Indian studies outside India outnumber the studies from India.3

In this issue two groups form North West India report two different but relevant clusters which eventually will be used later to qualify the real Indian criteria for both lipids and may be even Metabolic Syndrome; namely lipid cluster form Chandigarh4 and low socioeconomic cluster form Jaipur.5 The group from PGI Chandigarh reports isolated lipid abnormalities in 47 to 51 % in rural-urban non diabetic cohort essentially highlighting the low HDL and elevated Triglycerides only with surprisingly low frequency of isolated low LDL abnormalities -0.8 - 9.2% except male hypertensives.4 The classical Indian lipid triad is low HDL, elevated triglyceride and elevated LDL cholesterol; apart form abnormal ratios as the most common finding in most other Indian studies.5,6 Therefore such varied results only highlight that there is no standardized normal lipid levels in the Indian population. This is due to the fact that most laboratories estimate LDL by formulas and are not validated with flaws like non fasting, lack of uniform anything tools, regional variations apart from dietary intake of oils and fats. It is an area of future research and there is a need to evolve normative values for Indian population. The normal Indian lipid cut offs which are likely to emerge are Total Cholesterol < 180 mg%, Triglyceride < 100 to 150 mg%, HDL > 35 mg% for men and 38 mg% women and LDL < 80-100 mg%.

High prevalence of obesity and insulin resistance in urban Indian population is well known. In a study form Chennai, Mohan et al report 18.7% prevalence of IRS in upper socio-economic strata in South India, while it was 6.5% in the lower socio-economic strata. The data on rural-urban differences in prevalence of Insulin Resistance parallel the prevalence of type 2 diabetes in rural and urban areas.5,4 In this issue Gupta et al, from Jaipur study in the highlights a unique low
socioeconomic cohorts. In the first study with increasing educational status a significant increase of obesity, total cholesterol, LDL cholesterol and triglycerides and decrease in smoking was observed. In the second study increasing education was associated with decrease in smoking, leisure-time physical inactivity, total and LDL cholesterol, and triglycerides and increase in obesity, truncal obesity and hypertension. Increase in smoking, diabetes and dyslipidaemias was greater in the less educated groups.3

The emerging typical Asian Indian urban/migrant has phenotype of higher percentage of body fat at a lower value of body mass index (BMI), high waist hip ratio (WHR) at a relatively low waist circumference and less lean body mass as compared to ethnic groups. Asian Indian migrants have higher values of BMI and WHR and thicker skinfolds as compared to urban subjects in India, Asian Indian men had significantly thicker truncal skinfolds as compared to Caucasians. High body fat, often at BMI values that are in non-obese range is another characteristic phenotypic feature of Asian Indians, reported by several groups, including Banerji et al in Asian Indians in USA (mean BMI, 24.5 kg/m2, body fat ~33%) and Dudeja, Misra et al in Asian Indians in India (mean BMI 23.3 kg/m2, body fat ~35%).4 This leads to abnormal lean body mass (muscle) to fat ratio; sarcopenia with higher body fat composition. The emerging Asian Indian Phenotype is High body fat with relatively less body BMI, less lean body mass (Particularly in lower limbs), High BF/BMI ratio (Higher body fat per unit BMI), high waist-hip ratio (Absolute value of waist circumference may not be excessive), variable subscapular/triceps ratio, high intramyocellular lipids. Thus Asian metabolic syndrome is the constellation of adverse metabolic and clinical effects of insulin resistance. Its high and increasing prevalence and its profound impact on the major diseases which require that clinicians consider its diagnosis and management on a routine basis. Recently published guidelines on its definition now make convenient for providing their to be published/advanced manuscripts and original inputs.

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References


