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بسم الله الرحمن الرحيم

قَالُوا سُبْحَانَكَ لاَ عِلْمَ لَنَا إِلاَّ مَا عَلَّمْتَنَا إِنَّكَ أَنتَ الْعَلِيمُ الْحَكِيمُ

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INTRODUCTION

It was over 80 years ago that one of the first metabolic syndrome appeared As KYLIN a Swedish physician described a clustering of hypertension hyperglycemia and gout. (**Kylin, 1923**).

In 1947 Vague in a landmark paper reported that a particular obesity phenotype upper body android or male-type obesity was associated with the metabolic abnormalities often seen with type 2 diabetes and with CVD. The clinical importance of the syndrome was highlighted some 40 years later by Reaven who described the existence of a cluster of metabolic abnormalities with insulin resistance as the central pathophysiological feature and labeled it (syndrome x).

Surprisingly Reaven did not include obesity a factor that has been linked with the metabolic syndrome in nearly all subsequent reports (**Vague, 1979**) (**Reaven, 1988**)

The metabolic syndrome has numerous names including the deadly quartet, syndrome x, and the insulin resistance syndrome (**Kaplan, 1989**)

Number of organization formulated definition these were concordant in what are the essential component of metabolic syndrome, glucose intolerance, obesity, hypertension and

dyslipidemia But all differed in the details. (**DeFronzo, 1991**) (**Alberti and Zimmet, 1998**) (**Balkau and Charles, 1999**).

The first attempt at a global definition of the metabolic syndrome was made by a world health organization consultative group and published in 1999. According to WHO definition it was the physiological description of insulin resistance (measured by the euglycemic clamp) This definition identified several limitations of which the most important related to the use of euglycemic clamp to measure insulin sensitivity making the definition virtually impossible to use in either clinical practice or epidemiological studies (**Alberti and Zimmet, 1998**)

Recognizing that the who definition might be too complex to apply in many setting and as it relied heavily on insulin resistance. The European group for the study of insulin resistance (EGIR) developed a modified version of the WHO definition which would be easier to use as it relies on fasting insulin instead of the euglycimic clamp to measure insulin resistance the EGIR definition still retained insulin resistance as an essential component on the basis that they believed that insulin resistance was the underlying cause of the metabolic syndrome, but restricted the use of the definition to those in whom insulin resistance could be easily and reliable measured. hence, people with diabetes were excluded from the definition, as the beta cell dysfunction characteristic of type 2 diabetes make estimates of

insulin sensitivity unreliable the EGIR definition also introduce waist circumference as the measure of adiposity and included modified cut points for the other components. (94cm for men and 80 cm for women) (**Lemieux, 2000**).

Two years later. The national cholesterol education program of the USA introduced the ATP3 designed to have clinical utility this definition did not include a specific measure of insulin sensitivity and adopted a less "glucose –centric" approach by treating all component with equal importance. notably it retained waist circumference as the measure of obesity (although with higher cut points than EGIR (102 cm for men and 88 cm for women) the ATP3 definition has been popular because of its simplicity in that its component are easily and routinely measured in most clinical and research setting. (**Lemieux, 2000**).

A modification of the ATP3 definition was also developed by the American association of the clinical endocrinology (AACE) based on the belief that insulin resistance was the core feature. The AACE listed four factors as "identifying abnormalities" of the metabolic syndrome and these were elevated triglycerides reduced HDL-C, elevated blood pressure, and elevated fasting and post load of glucose. **(Pascot, 2000**).

The AACE excluded obesity as a component as they viewed central obesity as a contributory factor in the

development of insulin resistance rather than a consequence. (**Couillard, 2000**).

A new definition from the international diabetes federation: (IDF).

Clearly the development of these metabolic syndrome definitions over the years has led to considerable confusion .what was needed was definition that was useful for clinicians identify which person was at risk of type 2 diabetes and CVD and would facilitate epidemiological and clinical research into the metabolic syndrome. (**The IDF consensus Worldwide, 2005**).

In light of the controversy over the various limitations in the current definition, the IDF decided that a more practical definition, which would be applicable globally for the identification of people at high risk of CVD. And diabetes was urgently required. A consensus group was formed comprising members of IDF. The primary aim of this group was to develop a new definition which would be clinically useful. (**Eckel, 2005**).

The IDF group recognized that central obesity was an important determinant of the metabolic syndrome, and that there is a strong association between waist circumference, CVD and other component of the metabolic syndrome. In particular, visceral fat accumulation determined by CT scan has been

demonstrated to have close correlation with the development of metabolic and cardiovascular disease. (**Matsuzawa, 1997**).

The consensus group also placed particular emphasis on the developing criteria for central obesity which would be appropriate for a wide variety of a population. Body mass index. Though widely used. Is not sufficiently sensitive to detect central obesity in different ethnic groups. (**Lackland, 1992**).

The IDF consensus groups have a recommended cut points for central obesity based on waist circumference which are applicable to individual ethnic groups.

It was also decided that the definition should be less (glucose –centric) and the IDF definition has states of glucose intolerance in a non-essential position, moreover it was recognized that since there are practical difficulties in accurately measuring insulin resistance it was omitted as a component as other components such as waist circumference and triglycerides are so highly correlated with insulin resistance, that few of those with insulin resistance would be missed. (**Genuth, 2003**).

The IDF consensus group report has recommended further research on a comprehensive list of other components that should possibly considered as addition in future definition of metabolic syndrome, the list include: tomographic assessment of visceral adiposity and liver fat, adipose tissue biomarkers

(adiponectin, leptin). Apolipoprotein B, LDL particle size, formal measurement of insulin resistance and an oral glucose tolerance test, endothelial dysfunction, urinary albumin, inflammatory markers (c-reactive protein, tumor necrosis factor alpha, interleukin 6 and thrombotic markers (plasminogen activator inhibitor factor-1, fibrinogen). (**The IDF consensus Worldwide, 2005**) **(Matsuzawa, 2004**).

Nevertheless it would be prudent to suggest that new IDF definition is the final chapter for the metabolic syndrome definition and further research may stimulate modification. (**Gale, 2005**).