PL 1

The Metabolic Syndrome: Is This a Useful Concept?

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The Metabolic Syndrome has received increasing attention since the publication of Reaven in 1988 where he referred to Syndrome X. The original work stressed insulin resistance but over the intervening years other factors have taken on equal importance. These include central obesity, raised triglycerides, lowered HDL-cholesterol, raised blood pressure and raised plasma glucose levels. The first formal definition of the syndrome came from WHO in 1998 stressing the importance of insulin resistance and/or dysglycaemia, This was followed by a modified version from the European Study Group for Insulin Resistance and subsequently by the National Cholesterol Education Programme (ATP III). The three definitions all differed over cutpoints used and on the relative emphasis of different components. An IDF Consensus Group attempted to unify the definition and have recently published their findings. In this definition, central adiposity is a sine qua non. It is assessed by waist circumference and a big change from ATP III is that the waist circumference cutpoints are ethnic specific. In addition, two components are required of raised triglycerides, low HDL-cholesterol, raised blood pressure and raised glucose. The IDF criteria have the added advantage that measuring the waist can be used as a simple initial screening test. The value of the metabolic syndrome lies in its ability to identify those at high risk of developing cardiovascular disease (and diabetes). Many more long term studies are needed however to ensure that the correct components and cutpoints are being used.

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PL 2

Cellular Mechanisms of Insulin Resistance

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Type 2 diabetes is the most common metabolic disease in the world. In the United States it is the leading cause of blindness, end-stage renal disease and non traumatic loss of limb with associated health care costs estimated to exceed $130 billion per year. Of even greater concern, type 2 diabetes is rapidly becoming a global pandemic and is projected to afflict more than 300 million individuals worldwide by the year 2025, with most of the increase occurring in India and Asia. While the primary cause of this disease is unknown, insulin resistance plays a major role in its development. Evidence for this comes from cross-sectional studies demonstrating the presence of insulin resistance in virtually all patients with type 2 diabetes as well as prospective studies demonstrating the presence of insulin resistance one to two decades prior to the onset of the disease. In addition insulin resistance in the offspring of parents with type 2 diabetes has been shown to be the best predictor for the later development of the disease. Despite much work little is known about the factors responsible for insulin resistance in these individuals. In this regard recent studies measuring muscle triglyceride content by biopsy or intramyocellular lipid content by ^{1}H magnetic resonance spectroscopy have shown a strong relationship between intramuscular lipid content and insulin resistance in skeletal muscle. Recent studies have also demonstrated increases in intramyocellular lipid content in insulin resistant offspring of parents with type 2 diabetes suggesting that dysregulation of fatty acid metabolism may be responsible for mediating the insulin resistance in these individuals. Increases in the intramyocellular concentration of fatty acid metabolites in turn have been postulated to activate a serine kinase cascade leading to decreased insulin stimulated insulin receptor substrate-1 associated phosphatidylinositol 3-kinase activity resulting in reduced glucose transport activity and glycogen synthesis. This presentation will focus on recent studies using noninvasive ^{13}C, ^{31}P and ^{1}H magnetic resonance spectroscopy techniques in humans to examine the mechanism of fatty acid induced hepatic and muscle insulin resistance and more recent studies that have implicated functional defects in mitochondrial activity in the pathogenesis of insulin resistance.

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PL 3

Asia's Triple Epidamic-Diabetes, Obesity and the Metabolic Syndrome: Can the Tide be Turned?

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Diabetes mellitus affects large numbers of people from a wide range of ethnic groups and at all social and economic levels throughout the world. The last few decades of the 20th Century saw an explosive increase in this disorder globally, mainly in the number of people with type 2 diabetes. At the present time it is estimated that 190 million people worldwide have diabetes and that this will increase to 324 million by 2025.

The burden of diabetes is particularly severe in India and China. Two cross-sectional studies in an urban south Indian population have shown that the prevalence in the over 20s had risen from 8.3% in 1989 to 11.6% in 1995. For the year 2000, the prevalence in 6 major cities across India was reported to be 12.1%. In China, a prevalence of 3.1% in 1994 in the over 25 year age group, was almost two and a half times higher than a figure from the Chinese province of Da Qing eight years earlier. By 2001, the prevalence amongst those aged 35-74 had further risen to 5.5%. The epidemic of diabetes is accompanied by large secular increases in obesity and the metabolic syndrome in many Asian nations. This combination, a "triple epidemic" of major cardiovascular disease risk factors is resulting in an explosion of cardiovascular disease.

Type 1 diabetes is relatively uncommon in Asian and Pacific Island nations. The percentage of type 2 diabetes is greater than 95%. Apart from major prevalence increases, but the age of onset of type 2 diabetes and the metabolic syndrome is becoming younger concurrent with the rise in obesity. This pattern underlines the possibility that over the next decade, the "triple" epidemic of diabetes, obesity and the metabolic syndrome will continue to escalate. They have become one of the major threats to human health in Asia in the 21st Century.

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PL 4

The Yin (Art) and Yang (Science) of Diabetes Education

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Education has been the liberating process enabling people with diabetes to participate fully in ensuring their long term health and happiness. In order to realize their human potential, they are required to balance the demands of multiple metabolic and lifestyle factors as well as overcome society's attititudes of ignorance and discrimination. Implicit in this process is the role of the diabetes educator who, within the wider context of a skilled and caring team, promotes the concept of patient empowerment through self-discovery, personal values and goals, and brings forth the courage and will to change. This presupposes a willingness on the carers' part to accept the reality that patients – individuals, couples, families and their youngsters- each within their own sociocultural background , are trustworthy and capable of making self-management choices and moreover, are responsible for the consequences of these choices.

Embracing such philosophy requires a critical change in the axis of our scientific thinking, from the acute biomedical model and vertical education to a more daring biopsychosocial equal-partners concept and practice with emphasis on life issues and interactive learning. Whereas most professionals would hesitantly shy away from their patients' intricate life complexities, responding instead with a preprogrammed quick-fix solution (at times supplanted by automated voice-mails or computer generated algorithms), enlightened educators might use additional or alternative dimensions without in any way negating the value of the scientific basis of modern therapies. Strict reliance on the biomedical model of diabetes, undoubtedly essential in bringing relief from present and future suffering, tends to oversimplify the illness experience.

Additional skills, not traditionally included in professional curricula, could be learnt from the domain of human sciences and the arts to complement our basic scientific and reductionist training. Guidelines thresholds, target goals, GI indices, carb counts, basal rates and corrective doses delivered in prescriptive fashion are indeed important. The challenge remains, however, how to bridge the gap between this abstract, non-visual theoretical knowledge and something more familiar, closer to the heart, more developmentally and culturally appropriate. Most health professionals in the diabetes field are aware of the need to grasp fully the concept of "wholeness", of the unique identity of the person with diabetes in an alienating world with its own socio-cultural constructed meanings of health, illness, disability and handicap. How do we translate this awareness into action ? A method that is more applicable to the development of the attitudes and skills necessary to cope with the daily challenges with a life with diabetes might be worth exploring.

What forms of human expression can support the daunting task of learning to live with a demanding, restrictive and relentless life-long condition ? Story telling, subjective experiences as expressed by the patients themselves, metaphors, poetry, music, meditation ; these art forms have remained immutable since ancient times and yet are eternally alive, at the image of humanity and its emotional needs. The cognitive power of the metaphor as a teaching aid, "connecting" the educator exuding confident rational knowledge and the hesitant learner on unfamiliar territory, plays a unique role in all cultures and socioeconomic levels. In whichever form they take place, one-to-one or group communication, under a tree, in a consulting room or on the internet, shared experiences and a more vivid connection between "imageability" and learning offer different ways of understanding the diabetic life. Interwoven with either strictly taught strategies or even impersonal handouts such methods may have a greater chance of succeeding in bridging that gap.

The symbol of the Yin and Yang, depicting the perfect balance between the interactions of opposite in the universe, will guide this discussion highlighting some of the ethical principles of Taoism and the mutually interdependent roles of the arts and sciences in the field of diabetes education. The questioning of some of our biomedical "certainties" will hopefully not provoke misunderstanding but rather encourage open-mindedness

and even the quest to associate the best of our science, without which we cannot live in good health, with a fruitful humanistic enrichment through the medium of the arts.

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