

**【PL-4】****Metabolic Syndrome and Human Obesity: The facts and the challenges. What we can learn from the United States experience**

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We are in the midst of a global obesity epidemic and a global diabetes epidemic. In the USA, over 60% of adults are overweight/obese; in Korea about 30% of adults are overweight/obese. Overweight/obesity is increasing in our children. There are many researchers who believe that the epidemic of overweight/obesity is responsible for the large increases in type 2 diabetes and that the metabolic syndrome is a warning of future development of type 2 diabetes in some people. The metabolic syndrome is characterized by three or more of the following: high fasting blood glucose, central obesity (assessed clinically by waist circumference in men of >102 cm, in women of >88 cm), glucose intolerance, high plasma triglycerides, low plasma HDL cholesterol, and high blood pressure. In the U.S., some groups at increased risk for developing the metabolic syndrome include Asians, African Americans, American Indians, Hispanics/Latinos, and Pacific Islanders. It is not clear why the risk is greater in some groups than in others. There undoubtedly is a genetic basis but our genes have not changed. It is thought that it is the changing environment (increased food availability, larger portion sizes, less physical activity) is responsible and that “genetics loads the gun...while environment pulls the trigger.” This will be discussed in more detail. In the United States, risk for type 2 diabetes is increased when people are overweight [body mass index {BMI or  $\text{wt (in kg) / ht}^2 \text{ (in m}^2\text{)}$ ] is > 25 (U.S. National Health and Nutrition Examination Survey II or NHANES II). There are limitations to using BMI including that for people who are classified as overweight, they may have increased muscle mass not increased adipose tissue. BMI also does not address fat distribution (visceral or central adiposity vs. peripheral/central adiposity or lower body obesity). There is active debate as to whether carbohydrate or different types of carbohydrate (starch, sucrose, glucose, fructose) are responsible for this increase in the metabolic syndrome and obesity and whether there should be a DRI for carbohydrate or certain types of carbohydrate. Clearly, there are recommendations for protein and for certain types of fatty acids, vitamins, minerals and dietary fiber. Once these needs are met, I do not believe that we have enough evidence to limit carbohydrate. In the US, the Food and Nutrition Board of the Institute of Medicine/National Academy of Sciences has recommended that carbohydrate not be lower than 100 grams a day. Much more research is needed about the long-term effects of the possible relationship of different types of carbohydrate with obesity and the metabolic syndrome. It is clear that a weight loss of 5 to 7% of initial body weight decreases the metabolic syndrome (adiposity, dyslipidemia, blood pressure, decreases insulin resistance) as does regular exercise.