

Ten Tips for Healthy Longevity

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Despite tremendous efforts to prevent type 2 diabetes (T2DM), the incidence of obesity continues to increase all over the world [1,2]. A recent large cohort study has shown that obesity is associated with cardiometabolic disorders in most individuals [3], although an index of obesity, the body mass index (BMI), is not the sole marker of obesity, and abdominal fat may be more closely associated with morbidity [4]. This suggests that obesity, including “metabolically healthy” obesity, is rarely healthy in the long term, emphasizing the importance of prevention or treatment of obesity, irrespective of the current metabolic status.

Weight loss by caloric restriction substantially improves glucose metabolism in patients with recent-onset T2DM [5], suggesting the importance of an early intervention. On the other hand, in the same series of studies, the improvement of glucose tolerance by caloric restriction was shown to be dependent on the improvement of beta cell function, irrespective of reduction of either liver or pancreatic fat [6]. Recent advances in *in vivo* beta cell imaging techniques have revealed that beta cell function and mass are related to each other and both progressively decline with the disease course in subjects with glucose intolerance [7]. Thus, it can be assumed that the improvement of beta cell function is dependent on the residual amount of beta cell mass.

Prevention of obesity is also important for preventing the onset of T2DM in adolescents. Recent studies have shown that the adolescents with impaired glucose tolerance or recent-onset T2DM show greater insulin secretion, compensating greater insulin resistance, compared with the adults with glucose intolerance [8,9]. I have recently proposed that excess beta cell workload is the cause of beta cell loss, i.e., the beta cell workload hypothesis [10]. Dysfunction and/or death of beta cells due to overwork may be analogous to “karoshi” in our society, which may be more readily understandable by the general public. Greater workload of beta cells in adolescents with glucose intolerance will accelerate the progression of beta cell loss, consistent with recent observations [11-13]. Thus, there should be further focus on the prevention of obesity in the next generation.

A healthy lifestyle is critical to prevent obesity and T2DM. A healthy lifestyle includes appropriate caloric intake, reduced intake of saturated fat and sugar-containing snacks and beverages, increased intake of vegetables and unsaturated fat, an increase in physical activity [14-17], and possibly avoiding even a small amount of alcohol intake [18].

However, it is not very recently that the importance of a healthy lifestyle for longevity has been proposed. In the 18th century, during the Edo era in Japan, there were ten tips for health (Figure 1) [19]: (1) less meat, more vegetables; (2) less salt, more vinegar; (3) less sugar, more fruit; (4) less eating, more chewing; (5) less clothing, more sun-bathing; (6) less vehicle use, more walking; (7) less anxiety, more sleep; (8) less anger, more laughter; (9) less words, more action; and (10) less greed, more helping. This precious knowledge and experience of our ancestors are likely to be applicable to our current society to reduce the incidence of diabetes and extend healthy aging.

健康十訓 Ten tips for health

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|--------|---------------------------------|
| • 少肉多菜 | less meat, more vegetables |
| • 少塩多酢 | less salt, more vinegar |
| • 少糖多果 | less sugar, more fruit |
| • 少食多齧 | less eating, more chewing |
| • 少衣多浴 | less clothing, more sun-bathing |
| • 少車多歩 | less vehicle use, more walking |
| • 少煩多眠 | less anxiety, more sleep |
| • 少怒多笑 | less anger, more laughter |
| • 少言多行 | less words, more action |
| • 少欲多施 | less greed, more helping |

Figure 1. Ten tips for health proposed in the 18th century in Japan [19].

Article Information

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Received: Sep. 26, 2018; Accepted: Oct. 03, 2018; Published: Oct. 10, 2018

DOI: 10.24983/scitemed.de.2018.00084

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Funding: None

Conflict of Interest: None

Keywords

Diabetes; lifestyle; longevity.

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