Beyond glycaemic index: The role of insulin index in elderly dietary management

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ABSTRACT

Introduction: Food provides carbohydrates and energy essential for daily activities and sustaining life. Glucose molecules are the building blocks of carbohydrates, and the increase in blood glucose two hours after consuming the same amount of carbohydrates from different foods is known as the glycaemic index (GI). It is widely accepted that a low-GI diet benefits health, especially in individuals with metabolic diseases such as diabetes mellitus, hypertension, and hyperlipidaemia. In contrast, the insulin index (II) measures the rise in blood insulin levels two hours after food consumption. Although II has been overlooked in favour of GI, recent evidence suggests that II should be considered in dietary planning, as many low-GI foods have high II values. A meta-analysis of 54 randomized controlled trials by Zafar et al. found that low-GI foods alone were insufficient to reduce fasting insulin, insulin resistance, and insulin requirements in diabetics. This is particularly relevant in Malaysia, which has the highest diabetes rate in the Western Pacific region. This review explores the importance of understanding the interplay between GI and II in the elderly. **Materials and Methods:** A scoping review was conducted to explore the question: "What is the evidence regarding the impact of GI and II on the elderly?" Literature was searched using PubMed, Cochrane, ResearchGate, Web of Science, Google Scholar, Scopus, and the Malaysian Diabetes Clinical Practice Guidelines (CPG). Search terms related to GI, II, insulin resistance and hyperinsulinemia were applied accordingly. The current GI chart from the Malaysian Ministry of Health website was also referenced. **Results:** Seven relevant articles were included, comprising studies, reviews, and collectanea of food insulin indices. An infographic by the Malaysian Health Ministry categorizes common foods into low, moderate, and high GI. Some low-GI foods (≤55) have high II values when crosschecked with II values from a recent compilation from Hendricks et al. These II were 64, 84, and 140, for yam, watermelon, and skimmed milk respectively. This indicates that GI alone is insufficient to assess metabolic impact. Low-GI foods may still cause significant insulin spikes, insulin response and poor insulin clearance due to their carbohydrate and insulinotropic protein content, increasing insulin resistance and adipogenesis related risk. These risks are deduced to be more pronounced in the elderly. Literature shows that ignoring II and insulin response leads to poor diabetes control and that II is strongly associated with metabolic conditions. **Conclusion:** The belief that low-GI foods are essential for health should be revised to include II values to prevent hyperinsulinemia. GI may underestimate the metabolic effects of certain foods when viewed from the low GI-hyperinsulinemia paradox. Consuming high-II foods over time may raise the risk of insulin resistance, obesity, diabetes, and cardiovascular diseases, particularly in older adults Incorporating II into dietary planning and public health infographics is a non-invasive, cost-effective strategy. Additionally, there is a lack of local, elderly-focused studies on the II in clinical nutrition and ageing, highlighting the need for further research.

Keywords: Glycaemic index, insulin index, elderly, insulin resistance, hyperinsulinemia