Relation of dietary glycemic index, sugar intake and fiber intake to body composition, glucose and insulin profiles in adolescents from French Polynesia

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OBJECTIVES: Observational studies in adults suggest that a diet with a high glycemic index (GI), which is usually related to a high intake of sugary foods or a low fiber intake, may increase the risk of obesity and cardiovascular disease (CVD). We aimed to examine whether dietary GI, added sugar intake, or dietary fiber were associated with body composition, glucose and insulin profiles in adolescents from French Polynesia.

METHODS: We measured dietary GI, sugar and fiber intakes from 113 adolescents aged 12 to 17 years from Papeete (urban; capital of French Polynesia), Tubuai, Raivave and Rapa (rural; Austral Islands), using a 24-hour dietary recall. Bio-impedance analysis was used for the determination of body composition. Physiological measurements (fasting glucose and insulin concentrations) were obtained.

RESULTS: The mean dietary GI was lower in Austral Islands (GI=59±3 for Tubuai, Raivave and Rapa) compared to Papeete (GI=63±3; p=0.01). The 24-hour dietary recall showed higher daily consumption of total carbohydrate (p=0.006) and added sugar (p=0.005) among individuals living in rural communities compared to the urban ones. Higher dietary GI was positively correlated with higher fat mass (p=0.04) and fasting insulin levels (p=0.03) in Papeete, and lower body weight in Raivave (p=0.01). Added sugar intake was associated with lower fasting insulin levels in Rapa (p=0.02) and higher body weight in Papeete and Tubuai (p=0.01). Dietary fiber were associated with elevated fasting insulin levels in Papeete (p=0.02), and lower insulin levels in Rapa (p=0.001).

CONCLUSIONS: Dietary GI, added sugar intake and dietary fiber between ages 12 to 17 years appear to influence differently body composition and fasting insulin levels in urban and rural French Polynesian. Potential benefits associated with traditional diet and other favourable lifestyle factors, which are more predominant in rural communities, might induce early protection on cardiometabolic risk factors.

Number of words in abstract: 297

Keywords: Glycemic index - Adolescents - Body composition

Technical area: Health Challenges in the Pacific: Infectious Disease, Non-Communicable Disease and the Health Workforce

Special session: Not specified

Presentation: No preference

Special equipment: No special equipment