

Obesity is associated with systemic oxidative stress and leads to insulin resistance. Phenethyl isothiocyanate (PEITC), a natural dietary isothiocyanate, has been shown to have beneficial effects in improving cellular defense activities against oxidative stress through activation of nuclear factor erythroid-2 related factor 2 (Nrf2) pathway. However, little evidence exists if the antioxidative activity has beneficial effects on glucose metabolism. Here, we tested the preventive potential of PEITC for impaired insulin-induced glucose uptake by oxidative stress in 3T3-L1 adipocytes. Treatment with PEITC increased the expression of antioxidative enzymes regulated by Nrf2 such as γ -glutamylcysteine-synthetase, heme oxygenase 1, NAD(P)H:quinone oxidoreductase 1 and glutathione S-transferase, and reduced oxidative stress induced by H_2O_2 . Furthermore, PEITC restored impaired insulin-stimulated glucose uptake, translocation of glucose transporter 4 and insulin signaling by H_2O_2 . These results indicate that PEITC protected insulin-regulated glucose metabolism impaired by oxidative stress through the antioxidative activity in 3T3-L1 adipocytes.

Phenethyl isothiocyanate (PEITC) protects from insulin resistance induced by oxidative stress in 3T3-L1 adipocytes.

