Licorice flavonoids suppress abdominal fat accumulation and increase in blood glucose level in obese diabetic KK-A(y) mice.

Nakagawa K, Kishida H, Arai N, Nishiyama T, Mae T.
Functional Foods Development Division, Kaneka Corporation, Osaka, Japan.

Licorice, the root of the Glycyrrhiza species, is one of the most frequently employed botanicals in traditional medicines. In this study, we investigated the effects of hydrophobic flavonoids from Glycyrrhiza glabra LINNE on abdominal fat accumulation and blood glucose level in obese diabetic KK-A(y) mice. In order to enrich a fraction of hydrophobic flavonoids, licorice flavonoid oil (LFO) was prepared by further extracting licorice ethanolic extract with medium-chain triglycerides (MCT), and adjusting the concentration of glabridin, the major flavonoid of licorice, to 1.2% in oil. KK-A(y) mice aged 6 weeks were assigned to 5 groups (n=6 each), and fed a high-fat diet containing 0 (control), 0.5%, 1%, or 2% LFO, or 0.5% conjugated linoleic acid (CLA) for 4 weeks. Compared with the control, body weight gain and weights of abdominal adipose tissues were suppressed (p<0.05) by feeding the diet containing 2% LFO, and blood glucose levels after 2 and 4 weeks were suppressed by all of the diets containing LFO. Although CLA feeding suppressed (p<0.05) body weight gain, it increased (p<0.05) blood glucose level after 2 weeks compared with the control level. Furthermore, LFO and licorice ethanolic extract stimulated human adipocyte differentiation in vitro. These results indicate that licorice hydrophobic flavonoids have abdominal fat-lowering and hypoglycemic effects, possibly mediated via activation of peroxisome proliferator-activated receptor-gamma (PPAR-gamma).

PMID: 15516721 [PubMed - indexed for MEDLINE]