Black cohosh ameliorates metabolic disorders in female ovariectomized rats.

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Black cohosh ameliorates metabolic disorders in female ovariectomized rats.

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Abstract

Estrogen deficiency is associated with metabolic derangements in menopausal women. Black cohosh has been widely used as an alternative therapy in the treatment of menopausal syndrome. However, its role in metabolism needs to be defined. The aim of the present study was to investigate the long-term effect of black cohosh on glucose and lipid metabolism in a rat model of postmenopause. Adult female Sprague-Dawley rats were sham operated (SHAM), ovariectomized (OVX), OVX with the treatment of estradiol valerate (OVX+E), or OVX with the treatment of isopropanolic black cohosh extract (OVX+iCR). Body weight, body composition, and blood glucose levels of the animals were monitored. The rats were then sacrificed after 3 months of the treatments. At the end of the experiment, OVX+iCR and OVX+E rats exhibited a significant decrease in body weight gain, body and abdominal fat mass, serum triglyceride levels, hepatic fat accumulation, and adipocyte hypertrophy compared with OVX rats. In addition, insulin resistance and glucose intolerance were improved in OVX+iCR, but not in OVX+E rats. No hepatotoxicity was detected in OVX+iCR animals. Furthermore, Western blot analysis suggested the increased lipolysis in adipose tissue of OVX+iCR and OVX+E rats. Data from in vitro experiments using cultured primary rat adipocytes also showed that black cohosh could affect lipolysis of adipocytes. In conclusion, the long-term treatment of black cohosh at a proper dosage ameliorated metabolic derangements in OVX rats. This drug is thus promising for the treatment of metabolic disorders in menopausal and postmenopausal women.