Amelioration of hyperglycemia and metabolic syndromes in type 2 diabetic KKA(y) mice by poly(gamma-glutamic acid)oxovanadium(IV) complex.

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Abstract
Recently, we found that poly(gamma-glutamic acid)oxovanadium(IV) complex (VO(gamma-pga)) exhibits a potent antidiabetic activity in streptozotocin (STZ)-induced type 1 diabetic mice. This result prompted us to examine its ability to treat the type 2 diabetic model KKA(y) mice with insulin resistance. We studied the in vivo antidiabetic activity of VO(gamma-pga), compared with that of vanadium(IV) oxide sulfate (VS) as control. Both compounds were orally administered at doses of 5-10 mg (0.1-0.2 mmol) V kg(-1) body mass to the KKA(y) mice for 30 days. VO(gamma-pga) normalized the hyperglycemia within 21 days, whereas VS lowered the blood glucose concentration only by a small degree. In addition, the glucose intolerance, HbA(1c) level, hyperinsulinemia, hypercholesterolemia, and hyperleptinemia were significantly improved in VO(gamma-pga)-treated KKA(y) mice compared with those treated with VS. Based on these observations, VO(gamma-pga) is proposed to be the first orally active oxovanadium(IV)-polymer complex for the efficacious treatment of not only type 2 diabetes but also metabolic syndrome in animals.
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