Telmisartan reverses insulin resistance in mice

January 3 2013

Treating mice fed a high-fat diet with telmisartan reverses insulin resistance and glucose intolerance, but only when the peroxisome proliferator-activated receptor-δ gene is present, according to a study published online Dec. 13 in *Diabetes*.

(HealthDay)—Treating mice fed a high-fat diet with telmisartan reverses insulin resistance and glucose intolerance, but only when the peroxisome proliferator-activated receptor-δ (PPAR-δ) gene is present, according to a study published online Dec. 13 in *Diabetes*.

Li Li, from the Chongqing Institute of Hypertension in China, and colleagues examined the effects of telmisartan, an angiotensin receptor blocker, on insulin signaling and glucose uptake in wild-type mice and mice lacking the PPAR-δ gene in muscle.

The researchers found that, in cultured myotubes, treatment with telmisartan correlated with increased PPAR-δ expression and activated

transcriptional activity of PPPAR-δ. In cultured myotubes with palmitate-induced insulin-resistance, enhanced insulin-stimulated phosphorylation of Akt and Akt substrate of 160 kDa as well as translocation of Glu4 to the plasma membrane was seen with telmisartan treatment. Antagonizing PPAR-δ or phosphatidylinositol-3 kinase inhibited these effects. In cultured myotubes, insulin-stimulated glucose uptake which was reduced by palmitate could be restored by telmisartan. Similar results were observed in vivo in wild-type mice, but not PPAR-δ knockout mice, with telmisartan reversing high-fat diet-induced insulin resistance and glucose intolerance.

"In summary, we demonstrate that telmisartan has a profound role in the improvement of glucose homeostasis in skeletal muscle, which is associated with activation of the PPAR-δ/phosphatidylinositol 3-kinase pathway," Li and colleagues conclude. "These findings implicate PPAR-δ as a potential therapeutic target in the treatment of hypertensive subjects with insulin resistance."

More information: Abstract
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