Am J Med Sci. 2007 Jun;333(6):333-9.

Oral glucosamine in doses used to treat osteoarthritis worsens insulin resistance.

Pham T, Cornea A, Blick KE, Jenkins A, Scofield RH.

Source: Endocrinology Division, Department of Medicine, University of Oklahoma Health Science Center, Oklahoma City, Oklahoma, USA.

Abstract

BACKGROUND: Glucosamine is used to treat osteoarthritis. In animals, the compound is known to cause insulin resistance, the underlying abnormality in type 2 diabetes mellitus. Insulin resistance in humans taking oral glucosamine in doses used for osteoarthritis has not been studied.

METHODS: Volunteer human subjects (n = 38) without known abnormality of glucose homeostasis had fasting serum glucose, insulin, and lipids determined before and after taking 1500 mg glucosamine by mouth every day for 6 weeks. Fasting insulin and glucose were used to calculate homeostasis model assessment (HOMA-IR) and quantitative insulin sensitivity check index (QUICKI). Vascular elasticity was measured by pulse wave analysis. The paired Student's t test was used to compare baseline with posttreatment values. Pearson's correlation was used to determine the relation of baseline HOMA-IR with changes in other variables.

RESULTS: We found a rise in HOMA-IR after 6 weeks of glucosamine (2.8 versus 3.2, $P < 0.04$). The fall in HOMA-IR among the subjects was statistically related to a higher baseline HOMA-IR by Pearson's correlation($P < 0.01$). A rise in serum triglycerides and a rise in LDL cholesterol were statistically related to baseline HOMA-IR. Small artery elasticity fell, and the decrease was higher in those with the highest baseline HOMA-IR.

CONCLUSIONS: Notwithstanding its efficacy remaining in question, glucosamine is widely used as treatment for osteoarthritis, which is a condition associated with both obesity and type 2 diabetes mellitus. Our data indicate that persons with underlying poorer insulin sensitivity are at risk for worsening insulin resistance and vascular function with the use of glucosamine in doses used to treat osteoarthritis.