

Glucosamine Effects in Humans: A Review of Effects on Glucose Metabolism, Side Effects, Safety Considerations and Efficacy

ABSTRACT

Glucosamine is widely used to relieve symptoms from osteoarthritis. Its safety and effects on glucose metabolism are critically evaluated in this review. The LD₅₀ of oral glucosamine in animals is ~1,800 mg/kg with no adverse effects at 2,700 mg/kg for 12 months. Because altered glucose metabolism can be associated with parenteral administration of large doses of glucosamine in animals and with high concentrations *in vitro* studies, we critically evaluated the clinical importance of these effects. Oral administration of large doses of glucosamine in animals has no documented effects on glucose metabolism. *In vitro* studies demonstrating effects of glucosamine on glucose metabolism have used concentrations that are 100-200 times higher than tissue levels expected with oral glucosamine administration in humans. We reviewed clinical trial data for 3,063 human subjects. Fasting plasma glucose values decreased slightly for subjects after oral glucosamine for ~66 weeks. There are no adverse effects of oral glucosamine administration on blood, urine or fecal parameters. Side effects were significantly less common glucosamine than placebo or non-steroidal anti-inflammatory drugs (NSAID). In contrast to NSAID, no serious or fatal side effects have been reported for glucosamine. Our critical evaluation indicates that glucosamine is safe under current conditions of use and does not affect glucose metabolism.