Lack of toxicity of chromium chloride and chromium picolinate in rats.

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Source

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Abstract

OBJECTIVE:

To evaluate the safety of chromium (Cr) as a nutrient supplement. Several recent studies have reported beneficial effects of supplemental Cr at levels higher than the upper limit of the suggested intake for Cr. Trivalent Cr is considered relatively nontoxic but some recent unconfirmed studies have questioned its toxicity. We evaluated the toxicity of Cr chloride and a more bioavailable form of trivalent Cr, Cr tripicolinate.

METHODS:

Harlan Sprague Dawley rats (4 weeks of age) were fed a stock diet to which was added 0, 5, 25, 50 or 100 mg of Cr per kg of diet as chloride or picolinate. Fasting blood samples were taken at 11 and 17 weeks and animals sacrificed at 24 weeks of age. Lack of toxicity was demonstrated by blood and histological measurements. Chromium incorporation into tissues was determined by graphite furnace atomic absorption.

RESULTS:

There were no statistically significant differences in body weight, organ weights or blood variables among all the groups tested at 11, 17 and 24 weeks. Blood variables measured were glucose, cholesterol, triglycerides, blood urea nitrogen, lactic acid dehydrogenase, transaminases, total protein and creatinine. Histological evaluation of the liver and kidney of control and animals fed 100 mg/kg Cr as Cr chloride or picolinate also did not show any detectable differences. Liver and kidney Cr concentrations increased linearly for both the Cr chloride and picolinate fed animals.

CONCLUSIONS:

These data demonstrate a lack of toxicity of trivalent Cr, at levels that are on a per kg basis, several thousand times the upper limit of the estimated safe and adequate daily
dietary intake for humans. Animals consuming the picolinate supplemented diets had several-fold higher Cr concentrations in both the liver and kidney than those fed Cr chloride.

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