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Assessing orally bioavailable commercial silver nanoparticle product on human cytochrome P450 enzyme activity.

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Author information

Abstract

Abstract Nanotechnology produces a wide range of medicinal compounds, including nanoparticulate silver, which are increasingly introduced in various forms for consumer use. As with all medicinal compounds, potential drug interactions are an important consideration for ingested silver nanoparticles. Nanoparticulate silver-drug interactions may be mediated through induced oxidative stress in liver tissue where the majority of systemically bioavailable silver nanoparticles is found. To investigate whether an orally ingested commercially available colloidal silver nanoparticle product produces pharmacokinetic interference on select cytochrome P450 enzymes, a prospective, single-blind, controlled in vivo human study using simultaneous administration of standardized probes for P450 enzyme classes CYP1A2, CYP2C9, CYP2C19, CYP2D6 and CYP3A4 was conducted. Oral ingestion of a commercial colloidal silver nanoparticle product produces detectable silver in human serum after 14 days of dosing. This silver, however, elicits no demonstrable clinically significant changes in metabolic, hematologic, urinary, physical findings or cytochrome P450 enzyme inhibition or induction activity. Given their increasingly broad, diverse human exposures, future characterization of human cytochrome P450 enzyme activity for other systemically bioavailable nanotechnology products are warranted.

Study conducted using American Biotech Labs[®] 10ppm and 32ppm nano silver solutions.

KEYWORDS: Clinical study; in vivo; nanoparticles; pharmacokinetics; toxicology

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