Altern Ther Health Med. 2016 Jun:22 Suppl 2:24-31.

Cordyceps sinensis: Genotoxic Potential in Human Peripheral Blood Cells and Antigenotoxic Properties Against Hydrogen Peroxide by Comet Assay

Jovana D Vasiljevic, Lada P Zivkovic, Andrea M Cabarkapa, Vladan P Bajic, Ninoslav J Djelic, Biljana M Spremo-Potparevic

PMID: 27433838

Abstract

Context • Cordyceps sinensis (C sinensis) is a well-known, traditional, Chinese medicinal mushroom, valued for its beneficial properties for human health. C sinensis has been reported to have immunomodulatory, anticancer, antiaging, antioxidant and anti-inflammatory activity. Despite potential medicinal benefits, no previously published reports are available about the genotoxicity or antigenotoxicity of C sinensis, as detected by comet assay. Objective • The objective of the study was to evaluate both the genotoxic and antigenotoxic potential of an extract of C sinensis (CS extract) in human peripheral blood cells. Design • The research team designed a pilot study. Setting •The study was conducted at the Center for Biological Research, University of Belgrade, in Belgrade, Serbia. Participants • Participants were 6 healthy individuals (2 males and 4 females), between the ages of 20 and 45 y, recruited on a voluntary basis, who provided heparinized, peripheral blood samples. Intervention • Four concentrations of the CS extract-125 µg/mL, 250 µg/mL, 500 µg/mL, and 1000 µg/mL-were used in the treatment of tested blood cells from the blood samples. Three independent procedures were performed: (1) a genotoxicity assessment, (2) an antigenotoxicity assessment for pretreatment of human cells with the CS extract prior to their exposure to hydrogen peroxide (H2O2) (ie, an evaluation of the benefits of the CS extract as a preventive agent); and (3) posttreatment of human cells with the CS extract after their exposure to H2O2 (ie, an evaluation of the benefits of the CS extract as an interventional agent). Outcome Measures • Cells were graded by eye inspection into 5 classes, depending on the extent of DNA damage, representing: (1) class A-undamaged cells with no tail (<5% damaged DNA); (2) class B-low-level damage (5%-20%); (3) class C-medium-level damage (20%-40%); (4) class D-high-level damage (40%-95%), and (5) class E-total destruction (>95%).Results • The CS extract proved to be nongenotoxic because no induced DNA damage was detected at all tested concentrations. For the antigenotoxicity assessment of the pretreatment with the CS extract, only the 1000-µg/mL concentration showed a significant decrease in the number of cells exhibiting H2O2-induced DNA damage. For the posttreatment, the CS extract exhibited antigenotoxic potential by attenuating H2O2-induced DNA damage at all concentrations tested. The evaluation of repair kinetics showed a decrease in DNA-damaged cells 15 min after the application of the CS extract, reaching a maximum potency after 45 min. Conclusions • The results indicated that C sinensis can be used as a postapplicative agent that counteracts the effect of oxidative stress. The resulting reduction in DNA damage might be related to its scavenging properties and stimulation of DNA repair.

Related information

PubChem Compound (MeSH Keyword)