

Radio- and chemoprotective effects of Zhu-Ling Mushroom (*Polyporus umbellatus*) in human cultured cells and in mice

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Zhu-Ling Mushroom (*Polyporus umbellatus*) is a commonly used Chinese Medicine in the treatment of renal and liver disease. We examined the radio- and chemoprotective effects of PUPs in human lymphoblastoid TK6 cells and in ICR mice. The pretreatment of PUPs 30 min before irradiation significantly reduced radiation-induced micronuclei (MN) formation and tk mutant frequencies in TK6 cells. Pretreatments of PUPs at a dose of 50 mg/Kg by i.p. injection 30 min or 45 min before 6 Gy irradiation caused a significant decrease in the frequencies of MN in the peripheral blood reticulocytes of irradiated mice. Comparative studies showed that PUPs may be a better radioprotective agent with a higher inhibition ratio of radiation-induced micronuclei and tk mutant frequencies than a well-known radioprotective agent amifostine. Mechanistic study showed that administration of PUPs at a dose of 50 mg/kg 30 min before irradiation significantly reduced the Comet tail length in the peripheral blood leucocytes and decreased the formation of the oxidative DNA damage (8-hydroxy-2'-deoxyguanosine) and lipid peroxidation in irradiated mouse liver, implying that the antioxidant activity of PUPs may contribute to its radioprotective effect. Furthermore, PUPs caused a dose-dependent inhibition of cyclophosphamide-induced MN formation in TK6 cells. Pretreatments of PUPs at a dose of 50 mg/Kg by i.p injection 30 min before CP treatment resulted in statistically significant decrease in the frequencies of MN in the peripheral blood reticulocytes in mice. Our results suggest that the potential use of PUPs as a useful radio- and chemoprotective agent.